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New Research on Retirement Policy

Retirement Research Consortium
Nineteenth Annual Meeting

August 3-4, 2017

National Press Club
529 14th Street, NW
Washington, DC 20045

New Research on Retirement Policy

August 3-4, 2017

Meeting Organizers:

Alicia H. Munnell

Director, Center for Retirement Research at Boston College
Peter F. Drucker Professor of Management Sciences, Boston College

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Professor of Economics, University of Michigan

The Center for Retirement Research at Boston College (CRR), the University of Michigan Retirement Research Center (MRRC), and the NBER Retirement Research Center gratefully acknowledge financial support from the U.S. Social Security Administration (SSA) for this meeting. The findings and conclusions are solely those of the authors and do not represent the views of SSA, any agency of the federal government, the CRR, the MRRC, or the NBER.

AGENDA AT A GLANCE*

THURSDAY, AUGUST 3

		PRESENTER	DISCUSSANT
8:45-10:15	PANEL 1: HEALTH & RETIREMENT DECISIONS Estimating the Effect of Health on Retirement The Role of Work, Disability, & Health in Retirement Benefits & Labor Market Outcomes of Workers Denied SSDI	Pamela Giustinelli Amal Harrati Jody S. Hyde	Debra S. Dwyer Courtney C. Coile Lauren H. Nicholas
10:30-12:00	PANEL 2: HEALTH, HEALTH COSTS, & WELL-BEING How Much Does Health Spending Eat Away at OASI Benefits? Does Public Health Insurance Affect How Much People Work? Impact of MA Health Insurance Reform on Labor Mobility	Melissa McInerney Gal Wettstein Matthew Rutledge	Tricia Neuman Lauren Schmitz Nadia Karamcheva
12:15-1:00	LUNCHEON SPEAKER: Peter A. Diamond (Institute Professor Emeritus, MIT)		
1:15-2:45	PANEL 3: CHALLENGES TO MANAGING MONEY Dementia, Help with Financial Management, & Well-Being Retirement Prospects for Millennials: An Early Prognosis When Is It Hard to Make Ends Meet?	Geoff Sanzenbacher Richard W. Johnson Jialan Wang	Padmaja Ayyagari Sean Huang Benjamin J. Keys
3:00-4:30	PANEL 4: FAMILY TIES & RETIREMENT SECURITY Impact of Health Shocks & Spousal Deaths in Late Life Parental Transfers to Unemployed Children Transfers, Bequests, & Human Capital Investment in Children	James Poterba Kathryn A. Edwards Eric French	Chris Tamborini Stephanie Rennane Michael Davis

FRIDAY, AUGUST 4

8:30-10:00	PANEL 5: FACTORS AFFECTING ASSET ACCUMULATION Homeownership, Social Insurance, & Old-Age Security Optimal Illiquidity Can Knowledge Empower Women to Save More?	Stipica Mudrazija James Choi Drew M. Anderson	Stephanie Moulton David Richardson Judy Dougherty
10:15-11:45	PANEL 6: SOCIAL SECURITY CHANGES & RETIREMENT PLANS Behavioral & Consumption Effects of Social Security Changes How Do Pension Wealth Shocks Affect Working & Claiming? Employment Effects of the Social Security Earnings Test	Geoff Sanzenbacher Stefan Staubli Daniel Sacks	Melissa Kahn Mauricio Soto Gary Engelhardt
12:00-12:45	LUNCHEON SPEAKER: Keith Hall (Director, Congressional Budget Office)		
1:00-2:30	PANEL 7: LABOR POLICIES & JOB CHARACTERISTICS Earnings, Labor Supply, & Retirement Decisions The Value of Working Conditions Work-Life Balance & Labor Force Attachment	Ananth Seshadri Kathleen Mullen Marco Angrisani	Anthony Webb Sita N. Slavov Matthew Rutledge

* The titles and author names listed here may be abbreviated for space purposes.

Agenda

New Research on Retirement Policy

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AGENDA

THURSDAY, AUGUST 3, 2017

8:00-8:30 **REGISTRATION AND COFFEE**

8:30-8:45 **WELCOMING REMARKS**
Mark J. Warshawsky (Deputy
Commissioner, Retirement and
Disability Policy, SSA)

MORNING SESSION CHAIR
Alicia H. Munnell

PANEL 1
8:45-10:15 **WHAT IS THE IMPACT OF HEALTH ON
RETIREMENT DECISIONS?**

**Using Subjective Conditional
Expectations to Estimate the Effect of
Health on Retirement**
Pamela Giustinelli and Matthew D.
Shapiro

Discussant: Debra Sabatini Dwyer

**Characterizing Trajectories of Work,
Disability, and Health in Work and
Retirement: A Multi-State Analysis**
Amal Harrati, Peter Hepburn, and Mark
Cullen

Discussant: Courtney C. Coile

**The Benefits Trajectory and Labor
Market Outcomes of Older Workers
Who Are Denied SSDI on the Basis of
Work Capacity**
April Yanyuan Wu and Jody Schimmel
Hyde

Discussant: Lauren Hersch Nicholas

10:15-10:30 **BREAK**

PANEL 2
10:30-12:00 **HOW DO HEALTH AND HEALTH
COSTS AFFECT PEOPLE AND
PROGRAMS?**

**How Much Does Out-of-Pocket
Medical Spending Eat Away at Social
Security Benefits?**
Melissa McInerney, Matthew S. Rutledge,
and Sara Ellen King

Discussant: Tricia Neuman

**Does Public Health Insurance Affect
How Much People Work?**
Gal Wettstein

Discussant: Lauren Schmitz

**The Impact of Massachusetts Health
Insurance Reform on Labor Mobility**
Norma B. Coe, Wenliang Hou, Alicia H.
Munnell, Patrick J. Purcell, and Matthew
S. Rutledge

Discussant: Nadia S. Karamcheva

12:00-1:15 **BOX LUNCH**

LUNCHEON SPEAKER
Peter A. Diamond (Institute Professor
Emeritus, MIT)

AFTERNOON SESSION CHAIR
John P. Laitner

PANEL 3
1:15-2:45

**WHAT CHALLENGES DO PEOPLE
FACE IN MANAGING THEIR MONEY?**

**Dementia, Help with Financial
Management, and Financial Well-Being**

Geoffrey T. Sanzenbacher and Anek
Belbase

Discussant: Padmaja Ayyagari

**Retirement Prospects for Millennials:
What Is the Early Prognosis?**

Richard W. Johnson, Karen E. Smith,
Damir Cosic, and Claire Xiaozhi Wang

Discussant: Sean Huang

When Is It Hard to Make Ends Meet?

Brian Baugh, Jesse B. Leary, and Jialan
Wang

Discussant: Benjamin J. Keys

2:45-3:00

BREAK

PANEL 4
3:00-4:30

**HOW DO FAMILY TIES AFFECT
RETIREMENT SECURITY?**

**Financial Well-Being in Late Life:
Understanding the Impact of Adverse
Health Shocks and Spousal Deaths**

James Poterba and Steven Venti

Discussant: Christopher R. Tamborini

**Parents with an Unemployed Adult
Child: Labor Supply, Consumption,
and Savings Effects**

Kathryn Anne Edwards and Jeffrey B.
Wenger

Discussant: Stephanie Rennane

**Transfers, Bequests, and Human
Capital Investment in Children over
the Lifecycle**

Eric French, Andrew Hood, and Cormac
O'Dea

Discussant: Michael Davis

4:30-5:00

DISSERTATION FELLOWS POSTER SESSION
Holeman Lounge

FRIDAY, AUGUST 4, 2017

8:00-8:30 **REGISTRATION AND COFFEE**

MORNING SESSION CHAIR
Alicia H. Munnell

PANEL 5
8:30-10:00 **WHAT FACTORS AFFECT ASSET
ACCUMULATION?**

**Homeownership, Social Insurance, and
Old-Age Security in the United States
and Europe**
Barbara A. Butrica and Stipica Mudrazija

Discussant: Stephanie Moulton

Optimal Illiquidity
John Beshears, James Choi, Christopher
Clayton, Christopher Harris,
David Laibson, and Brigitte C. Madrian

Discussant: David P. Richardson

**Can Knowledge Empower Women to
Save More for Retirement?**
Drew M. Anderson and J. Michael Collins

Discussant: Judy Dougherty

10:00-10:15 **BREAK**

PANEL 6
10:15-11:45 **WOULD SOCIAL SECURITY CHANGES
PROMPT PEOPLE TO ALTER THEIR
PLANS?**

**The Behavioral and Consumption
Effects of Social Security Changes**
Wenliang Hou and Geoffrey T.
Sanzenbacher

Discussant: Melissa Kahn

**How Do Pension Wealth Shocks Affect
Working and Claiming?**
Rafael Lalive, Arvind Magesan, and
Stefan Staubli

Discussant: Mauricio Soto

**The Employment Effects of the Social
Security Earnings Test**
Alexander Gelber, Damon Jones, Daniel
Sacks, and Jae Song

Discussant: Gary V. Engelhardt

11:45-1:00 **BOX LUNCH**

LUNCHEON SPEAKER
Keith Hall (Director, Congressional
Budget Office)

AFTERNOON SESSION CHAIR
James Choi

PANEL 7
1:00-2:30 **HOW DO LABOR POLICIES AND JOB
CHARACTERISTICS INFLUENCE
RETIREMENT?**

**Understanding Earnings, Labor
Supply, and Retirement Decisions**
Xiaodong Fan, Ananth Seshadri, and
Christopher Taber

Discussant: Anthony Webb

**The Value of Working Conditions in the
United States**
Nicole Maestas, Kathleen J. Mullen,
David Powell, Till von Wachter, and
Jeffrey B. Wenger

Discussant: Sita Nataraj Slavov

**Work-Life Balance and Labor Force
Attachment at Older Ages**
Marco Angrisani, Maria Casanova, and
Erik Meijer

Discussant: Matthew S. Rutledge

2:30 CLOSING REMARKS

Panel 1: What Is the Impact of Health on Retirement Decisions?

Using Subjective Conditional Expectations to Estimate the Effect of Health on Retirement

Pamela Giustinelli (Bocconi University) and Matthew D. Shapiro (University of Michigan)

Discussant: Debra Sabatini Dwyer (State University of New York at Stony Brook)

Characterizing Trajectories of Work, Disability, and Health in Work and Retirement: A Multi-State Analysis

Amal Harrati (Stanford University), Peter Hepburn (University of California, Berkeley), and Mark Cullen (Stanford University and NBER)

Discussant: Courtney C. Coile (Wellesley College)

The Benefits Trajectory and Labor Market Outcomes of Older Workers Who Are Denied SSDI on the Basis of Work Capacity

April Yanyuan Wu and Jody Schimmel Hyde (Mathematica Policy Research)

Discussant: Lauren Hersch Nicholas (Johns Hopkins University)

Using Subjective Conditional Expectations to Estimate the Effect of Health on Retirement

Pamela Giustinelli
Bocconi University

Matthew D. Shapiro
University of Michigan

Prepared for the 19th Annual Joint Meeting of the Retirement Research Consortium
August 3-4, 2017
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The future solvency of the U.S. Social Security program is threatened by projected costs exceeding revenues. The feasibility and effectiveness of increasing the retirement age hinges on workers' ability to work longer, which in turn depends crucially on how workers' health evolves as they age.

Our paper provides a novel strategy for quantifying the causal relationship between the health and labor supply of older workers and for simulating the effects of hypothetical changes to the health distribution of the target population on the population's labor supply forecasts at specified horizons. In particular, our paper addresses the following research questions of interest to the Social Security Administration:

1. Will currently healthy older workers have the health capacity to work in two years? In four years?
2. Will currently healthy older workers work longer in two years? In four years?
3. How does working longer depend on health? What is the distribution of these causal effects of health on work for these workers?
4. How would population-level forecasts of labor supply at two and four years change if the probability of entering low health at those horizons were reduced?

We address these questions with novel survey data on the labor supply and health expectations of a sample of healthy older workers participating in the *Vanguard Research Initiative* (VRI). In the 2014 wave of the VRI, these respondents were asked to report the likelihood (on a 0-100 percent chance scale) that they will be working to specified horizons (two and four years) under alternative health scenarios ("high" and "low" health). They also reported their unconditional likelihoods of working to those horizons and of entering those health states.

To answer Question 1, we analyze respondents' expectations about their health in two and four years. The mean of the distribution of respondents' health expectations can be interpreted as a population-level forecast of the proportion of currently healthy and working older individuals who will be in high vs. low health. These forecasts, which are shown in Figure 1, provide population-level estimates of current workers' capacity to work at the specified horizons.

For Question 2, we analyze respondents' unconditional expectations of working in two and four years. Once again, the mean of the distributions of respondents' working expectations yields a population forecast of the labor supply at the specified horizons. These forecasts, which are shown in Figure 2, represent population-level estimates of the proportions of currently healthy older workers who are predicted to work at the specified horizons.

For Question 3, we analyze respondents' expectations of working in two and four years where they turn out to be in high health or, alternatively, in low health. The mean of the distribution of subjective working expectations *conditional* on remaining in high health in two (four) years is an estimate of the *hypothetical* or *counterfactual* proportion of current workers who would work in two (four) years if all of them happened to remain in high health in two (four) years. The mean of the distribution of subjective working expectations, conditional on entering low health, has a symmetric interpretation. The difference between these two hypothetical or counterfactual quantities yields the subjective *ex ante* treatment effect (SATE) of health on work at the individual level. Figure 3 shows population estimates of the (absolute value of the) average SATE (ASATE) at two and four years.

For Question 4, we use our SATE estimates to simulate the effect of reducing in half each person's baseline likelihood of entering low health in two and four years on the population labor supply forecasts at those horizons. We find that these hypothetical changes in the chances of entering low health increase the estimates of the proportion of individuals predicted to work in two years by 2 percentage points and in four years by 3 percentage points. Figure 4 shows the four-year estimates.

Figure 1. 2- and 4- Year Ahead Health Forecasts

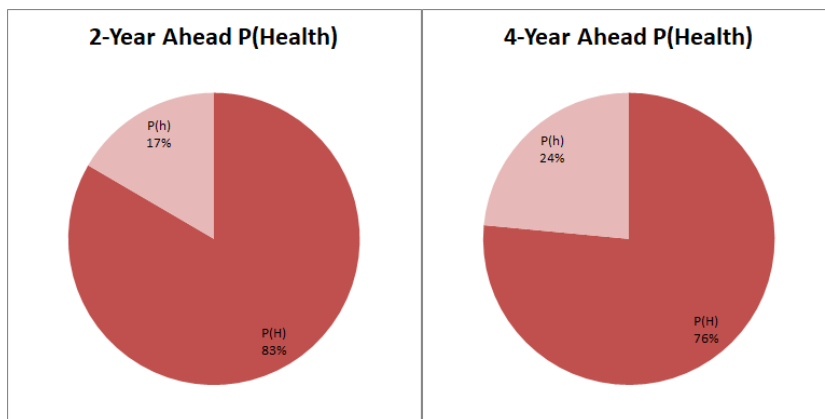


Figure 2. 2- and 4-Year Ahead Labor Supply Forecasts

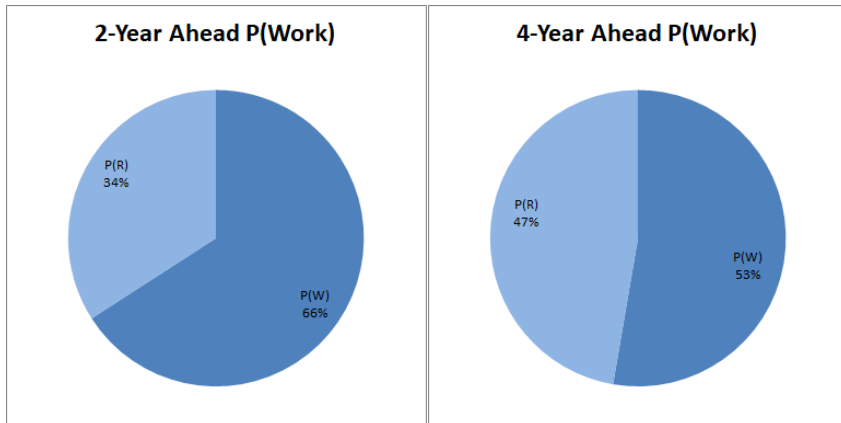


Figure 3. 2- and 4-Year Ahead Aggregate SATE

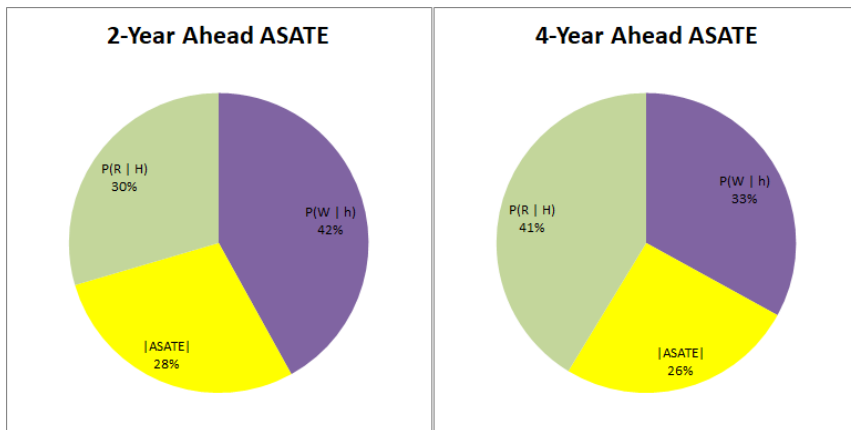
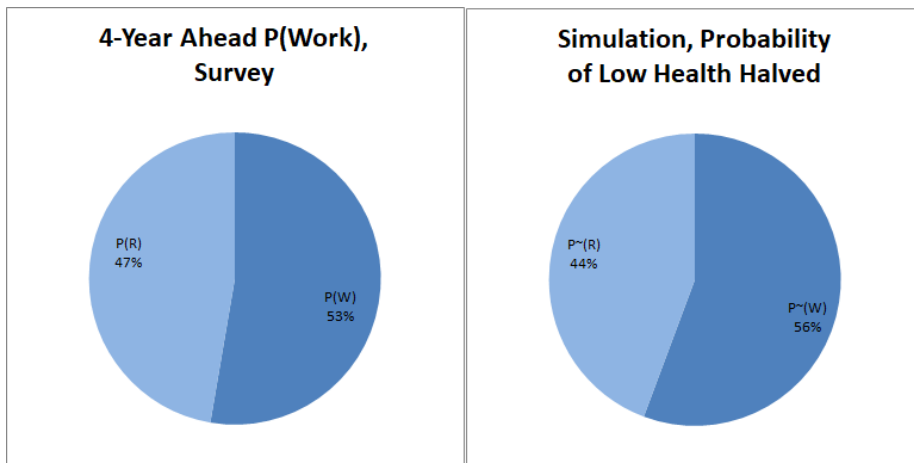


Figure 4. 4-Year Ahead Labor Supply Forecasts, Survey vs. Simulation with $\tilde{P}(h) = P(h) / 2$



**Characterizing Trajectories of Work, Disability and Health in Work and Retirement:
A Multistate Analysis**

Amal Harrati
Stanford University

Peter Hepburn
University of California, Berkeley

Mark Cullen
Stanford University and NBER

Prepared for the 19th Annual Joint Meeting of the Retirement Research Consortium
August 3-4, 2017
Washington, DC

The research reported herein was pursuant to a grant from the U.S. Social Security Administration (SSA), funded as part of the Retirement Research Consortium. The findings and conclusions expressed are solely those of the authors and do not represent the views of SSA, any agency of the federal government, Stanford University, the University of California, or the NBER Retirement Research Center.

A growing body of research explores the complex relationships between disability, employment, and health. Transitions from work to disability have a range of direct, negative effects on labor force participation, unemployment, lifetime earnings (Breslin et al. 2007), and permanent exclusion from the labor market. Transitions into short- and long-term disability are associated with increased medical costs (Sears et al. 2013) and psychological distress (Bültmann 2002). A number of health conditions are associated with an increased risk of workplace disability, including rheumatoid arthritis, diabetes (Virtanen 2015), musculoskeletal problems, depression (Kessler et al., 1999), and neuroticism. Aspects of working conditions, including psychosocial factors (Sullivan, 2013, Iles 2008), task monotony, and experienced stress of daily activities, are predictors of disability (Appelberg et al., 1996).

Previous research on these topics is limited by at least two problems. First, little research attempts to account for the endogeneity between employment, health, and disability. That is, studies explore the effects of health on disability or vice versa but rarely in a manner that acknowledges the bidirectional relationships at play. Second, most studies rely on data collected over short time frames, with either limited or delayed follow-up. Such data limit the conclusions that can be drawn about long-term trajectories and may mask significant variations. Many studies that observe rates of transitions back to work after a health shock or disability episode, for example, find rates of return to work (a measure of success) to be quite high. Longer-term data, however, may reveal a different pattern.

In this paper, we bring to bear a large set of administrative data that allow us to track the employment, health, and disability of a large cohort ($n=42,146$) of workers at Alcoa, a major U.S. manufacturing firm. These data are both dynamic – capturing changes to employees' job characteristics, health, and employment status as they occur – and long-term, following individuals so long as they are employed at the firm. We use these data to characterize the trajectories of work and disability across the employment tenure and to explore variations in the trajectory by demographic characteristics, health, and working conditions. To do so, we employ two techniques. First, we use sequence and cluster analyses to derive a typology of working tenures. Second, we use multinomial logistic regression to model the varying likelihood of cluster membership by worker and job characteristics.

The clustering process described above yields eight groups (ASW of 0.723). Table 1 provides a schematic of the clusters. We collapse these clusters into three typologies based on their similarity: “Regular Work,” “Short STD,” and “Disruptive Work.”

Multinomial logistic regressions examine the associations between a number of demographic, job, and health-related characteristics and membership in the three composite groups. Neither age at first employment nor race have significant effects on tenure classification. Sex is significantly associated with membership: being a woman increases the odds of inclusion in the Disruptive Work type.

The number of outpatient hospitalization visits for heart disease, hypertension, and musculoskeletal conditions are all associated with significantly lower odds of membership in the Regular Work clusters. Health appears to be strongly associated with work trajectories in the Disruptive Work typology in a number of ways. First, with regard to risk score, a one-standard-deviation increase in risk score raises the odds of inclusion in this typology more than 1.4 times. Secondly, hospitalizations of arthritis, heart disease, hypertension, asthma and depression all increase the risk of inclusion in this category. Exposure to cumulative total particulate matter increases the odds of inclusion in both Short STD and Disruptive Work (with the highest odds for the latter). Exposure to total particulate matter increases the likelihood of being in the Disruptive Work category, has nearly no effect on the Disruptive Work group, and slightly decreases the likelihood of being in the Short STD group.

Our analysis reveals a number of interesting conclusions. First, there are a large number of distinct and diverse work patterns. While the majority of workers in this sample have very stable working patterns, there are a number of divergent patterns, some that can be viewed as quite disruptive to job performance and work productivity.

Some demographic and health characteristics are particularly salient in this analysis. Of particular interest, for example, is the high likelihood of women being included in the Disruptive Work typology. Certainly, given that this sample refers to manufacturing, the women working in this sample may be select in a number of observable and unobservable ways. Little is known about women working in manual labor, and these results point to the importance of further exploration into this special population.

There also appear to be important gradients related to health characteristics and chronic disease. A particular highlight is the finding that depression increases the likelihood of being in a Disruptive Work typology but not any other category. Depression is often overlooked as a potential driver of job disruption relative to other chronic disease, though evidence does point to its importance in labor market participation and worker productivity (Lerner et al., 2008).

Table 1. *Cluster Sequences and Typologies*

Cluster sequences	Typology	N	Percent sample
Work	Regular work	12,656	30.0%
Work-terminate	Regular work	11,246	25.6
Work-retire	Regular work	4,736	11.2
Work-STD-work	Short leave	5,432	11.9
Work-STD-work-term	Short leave	2,683	6.3
Work-LOA-work	Short leave	1,713	4.1
Wk-STD-Wk-STD-Wk	Disruptive	3,132	7.4
Wk-STD-Wk-STD-Wk-STD-Wk	Disruptive	1,462	3.5

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**The Benefits Trajectory and Labor Market Outcomes of Older Workers
Who Are Denied SSDI on the Basis of Work Capacity**

April Yanyuan Wu and Jody Schimmel Hyde
Mathematica Policy Research

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The research reported herein was pursuant to a grant from the U.S. Social Security Administration (SSA), funded as part of the Disability Research Consortium. The findings and conclusions expressed are solely those of the authors and do not represent the views of SSA, any agency of the federal government, or Mathematica Policy Research. The authors gratefully acknowledge the excellent programming assistance provided by Lakhpreet Gill at Mathematica Policy Research.

As workers approach retirement, it becomes more likely that they will have experienced a health condition that limits their ability to work. The likelihood that a worker continues to work depends on the nature and severity of the health condition, the nature of the occupation and the willingness of the worker's employer to provide accommodations, and the ability of the worker to find an alternate position with the same or another company. Those unable to continue to work due to their health or functional status who have a lengthy employment history may be eligible for Social Security Disability Insurance (SSDI). SSDI cash benefits can offset some of the earnings losses from labor force exit prior to claiming Old Age and Survivors Insurance (OASI) benefits.

Yet receiving SSDI benefits after applying for them is far from certain; our findings indicate that among disabled worker applicants over the age of 50, about half are initially denied benefits. There are several reasons why applicants might be denied SSDI benefits, reflecting the staged disability determination process (Wixon and Strand 2013). Our study considers SSDI applicants denied for "work capacity" reasons. Work capacity denials occur because the disability examiner believes, after assessing the applicant's residual functional capacity, that he or she: (1) can return to his or her past job; or (2) can, given the applicant's age, education, and work experience, work at another job that exists in the U.S. economy. In making this determination, examiners do not account for the willingness of employers to hire denied applicants or for whether other types of jobs exist in their commuting area, both factors which could be particularly salient for workers approaching retirement age. Thus, it is important to understand the extent to which applicants denied for work capacity reasons ultimately return to work and the types of jobs in which they work.

We consider the post-denial benefits trajectory and employment outcomes of older SSDI applicants who are initially denied benefits for work capacity reasons.¹ We do this using the *Health and Retirement Study* (HRS) linked to Social Security Administration (SSA) records on benefit application and receipt. By linking SSA's 831 to the HRS, we identified 805 applications for SSDI disabled worker benefits that occurred after an individual was first interviewed by the HRS (a condition we needed to impose to observe characteristics prior to application).

¹ Our work is similar to the focus of recent studies by Strand and Trenkamp (2016) and SSA's Office of the Inspector General (OIG 2017), both of which relied solely on administrative data to consider the outcomes of denied applicants. The studies differed from ours in their focus; Strand and Trenkamp consider denials (across all ages) for SSDI because applicants can work in another occupation, while the OIG report considers denials across all ages for SSDI as well as SSI.

The majority of older SSDI applicants are allowed or denied benefits based on work capacity reasons (see Table 1). Among the allowed applicants, about one-third were allowed at step 3, because their impairment met or equaled the listings, while two-thirds were allowed at step 5 for work capacity reasons. Among those denied, the share was about the same, with two-thirds being denied for work capacity reasons. Being denied for being able to work in the applicant's past job was more than twice as common as being denied for being able to work in another job (22.9 and 9.3 percent of the total, respectively). Our analysis shows that in the years prior to application, these groups differed on demographic, health, and socioeconomic measures. For example, relative to other denied applicants, those denied because they were found able to work in their past job were more likely to be unmarried women with only a high school education.

Table 1. *Initial Outcomes of SSDI Applications Filed by HRS Respondents after Their First HRS Interview*

Initial application outcome	Number (Share of total)
<i>Allowed</i>	421 (52.3%)
Medical reasons (impairment meets or equals the listings)	133 (16.5)
Medical-vocational reasons (inability to perform past job or another job)	288 (35.8)
<i>Denied</i>	384 (47.7)
Medical reasons (impairment not severe or not expected to last 12 months) ^a	125 (15.5)
Medical-vocational reasons	
Ability to perform past job	184 (22.9)
Ability to perform another job	75 (9.3)

^a The majority of denials in this group were because the impairment was not severe or not expected to last 6 months. We also included in this group a small handful of cases who failed to follow the prescribed treatment or failed to submit to a consultative exam or who provided insufficient evidence to complete the claim.
Source: Authors' calculations using the HRS linked to SSA's 831 file. Regulation Basis codes used by SSA to document the reason for the allowance or denial are assigned to each group following the scheme identified in Wixon and Strand (2013).

Prior to considering the extent to which denied applicants returned to work and the occupations to which they returned, we explored how many initial denials ultimately received benefits. It is unlikely that denied applicants who appeal their initial outcomes or reapply for SSDI return to work, at least in the short term, given that an inability to engage in substantial gainful activity is a requirement for eligibility. We find that a substantial share of applicants

denied on the basis of work capacity were subsequently allowed on appeal, or they reapplied and were allowed on that later application.¹ Just under two-thirds of all applicants initially denied for work capacity were ultimately allowed SSDI (63.6 percent of those denied for a past job and 62.7 percent of those denied for another job), compared to 31.2 percent of those denied for medical reasons. Among applicants initially denied SSDI for work capacity reasons who did not receive benefits on appeal or reapplication, we find that the majority claimed OASI prior to SSA's full retirement age.

Given that a high share of applicants in our sample ultimately appeal or reapply, it should be unsurprising that relatively few applicants denied for work capacity reasons had returned to work about a year after the initial denial. Among all applicants denied for work capacity reasons, we find that 13 percent were working about one year after the initial denial, compared to 22 percent of those denied on the basis of medical factors. Among those who were working, they had annual earnings that were substantially less than they were before application, in part reflecting many who were working part-time. It is possible that if we considered subsequent years following denial, we might have seen a higher share returning to work. Yet, because the average age at application was around 58 years, most were approaching the age at which they could claim OASI (as early as age 62 for actuarially reduced benefits), so we would not expect large increases in employment.

Our findings signal that for older SSDI applicants who initially receive a work capacity denial, most go on to receive SSDI and few return to work, at least about a year after the initial denial. The decision to return to work among older applicants approaching retirement age likely differs from that of younger applicants who have many working years remaining. Yet, remaining productive at older ages is an aspiration of many and can help improve financial security after retirement. To shed light on the types of training that might prove promising for helping older workers with disabilities to remain in the labor force, our study assesses the occupational requirements and skills used by denied applicants in their jobs before application, and considers differences in those requirements and skills based on the likelihood of returning to work following denial.

¹ Because the 831 files only contain information on the initial decision, we linked to the Cross-Year Benefits file to identify applicants who subsequently received SSDI (meaning they must have appealed the decision and received an allowance). In cases where we saw a denied SSDI applicant with a subsequent SSDI application, we determined that applicant to have reapplied, with allowance or denial based on the initial outcome of that application or the presence of SSDI benefit receipt in the Cross-Year Benefits file.

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Panel 2: How Do Health and Health Costs Affect People and Programs?

How Much Does Out-of-Pocket Medical Spending Eat Away at Social Security Benefits?

Melissa McInerney (Tufts University) and Matthew S. Rutledge and Sara Ellen King (Boston College)

Discussant: Tricia Neuman (Kaiser Family Foundation)

Does Public Health Insurance Affect How Much People Work?

Gal Wettstein (Boston College, Dissertation Fellow)

Discussant: Lauren Schmitz (University of Michigan)

The Impact of Massachusetts Health Insurance Reform on Labor Mobility

Norma B. Coe (University of Washington), Wenliang Hou and Alicia H. Munnell (Boston College), Patrick J. Purcell (U.S. Social Security Administration), and Matthew S. Rutledge (Boston College)

Discussant: Nadia S. Karamcheva (Congressional Budget Office)

How Much Does Out-of-Pocket Medical Spending Eat Away at Social Security Benefits?

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Prepared for the 19th Annual Joint Meeting of the Retirement Research Consortium
August 3-4, 2017
Washington, DC

This research was supported by a grant from the U.S. Social Security Administration (SSA) as part of the Retirement Research Consortium (RRC). The findings and conclusions are solely those of the authors and do not represent the views of SSA, any agency of the federal government, Tufts University, or the Center for Retirement Research at Boston College. The authors are grateful to Bernard Ho for excellent research assistance.

The general public and most policy analysts tend to evaluate the adequacy of Social Security benefits based on the total level of retirement income they provide. More relevant to retirees' purchasing power, though, is their Social Security income net of out-of-pocket (OOP) medical costs, which are often considered nondiscretionary. By this measure, the adequacy of Old Age and Survivors Insurance (OASI) benefits has been on a decades-long decrease due to rising OOP costs. Until a slowdown during this decade, OOP costs for Medicare beneficiaries rose dramatically – costs increased by 44 percent between 2000 and 2010 (Cubanski et al., 2014) – and they are expected to continue to rise faster than overall inflation. Further growth in OOP costs would resume the decline in the share of retirees' Social Security income available for everyday, non-medical expenses.

This project examines how Social Security income net of OOP medical costs differs across individuals using the *Health and Retirement Study* (HRS) from 2002 to 2014. This recent time period, for which the HRS has complete data on premiums and other out-of-pocket medical spending, also allows for the examination of the change in OASI income net of OOP costs before and after the 2006 introduction of Medicare Part D.

This project's approach is similar in spirit to the information presented in the Medicare Trustees Report (see Figure II.F.2 of the 2017 report), which shows the average portion of care covered under Medicare Parts B (physician and outpatient care) and D (prescription drugs) for which the beneficiary is responsible relative to average Social Security income. But this project differs in two important ways. First, it uses individual-level data rather than averages. The individual data allow for addressing questions such as whether medical costs comprise a larger share of OASI benefits for the near-poor who do not qualify for Medicaid but have a difficult time purchasing supplemental insurance, or whether benefit adequacy is a bigger problem for seniors with the most health complications or for the oldest old. Second, the OOP measure used in this investigation is expanded to include all costs borne by Medicare beneficiaries, including OOP spending on hospital care (usually covered under Part A) and other uncovered health expenses that eat into retirees' Social Security income. The analysis also accounts for supplemental insurance coverage from Medicaid, Medicare Advantage, and retiree health insurance. This analysis is important to the Social Security Administration because premiums

and cost sharing at the average, and OOP costs limited to medical care covered under Parts B and D, provide an incomplete picture of individual benefit adequacy.¹

Data and Methodology

The sample consists of Social Security beneficiaries ages 65 or older enrolled in Medicare. The outcome of interest is the post-OOP benefit ratio for Social Security beneficiary i in year t :

$$\text{Post OOP benefit}_{it} = \frac{(\text{OASI benefit}_{it} - \text{OOP}_{it})}{\text{OASI benefit}_{it}} \quad (1)$$

This ratio captures individual i 's share of OASI benefits available for non-medical spending. The project uses the 2002-2014 waves of the HRS to compute this ratio, where OOP spending is constructed from the core module questions about medical spending over the previous two years, and Social Security income is based on self-reported monthly benefits.² To exclude long-term care costs, the sample excludes individuals who reported spending time in a nursing home at some point.³

Results

Medical spending and the post-OOP benefit ratio. The typical (median) Social Security retirement beneficiary has about 85 percent of his benefit remaining after paying for premiums and cost sharing, as of 2014. But because medical spending is quite high for some individuals – median OOP spending was about \$2,400 in 2014, but was \$3,100 at the mean and \$4,400 at the

¹ The project builds on several previous studies that were interested in the OOP burden on retirees but did not focus on how this burden compares to Social Security income or did not fully reflect the differences by sources of supplemental insurance (Webb and Zhivan 2010; Cubanski et al. 2014; Akincigil and Zurlo 2015; Favreault and Johnson 2016).

² The analysis begins in 2002 to provide a consistent measure of out-of-pocket costs accounting for premiums; the HRS only began collecting premiums for Medicare Advantage in 2002. The analysis also includes premiums from up to three private supplementary plans, and – beginning in 2006 – Medicare Part D. The analysis also adds the premium for Part B (for respondents who do not report Medicaid), which is not reported in the HRS. The measure of OASI benefits is constructed from the reported Social Security check amount plus the Part B premium (where applicable), since the self-reported Social Security amount is net of deductions. The next draft will include Social Security income calculated from administrative records.

³ As a next step, the project will incorporate *Consumption and Activities Mail Survey* (CAMS) data on medical spending.

75th percentile – the post-OOP ratio varies greatly across retirees. The average post-OOP ratio is 75 percent, implying that only about three-quarters of OASI income remains for the average retiree. For approximately 3 percent of the sample, OOP costs actually exceed OASI income.

Heterogeneity by type of supplemental insurance, income quintile, age, and health status.

Because they have to pay extra premiums, Medicare Advantage enrollees have less of their OASI income left after medical spending (77 percent) than those with only Medicare coverage (84 percent). The post-OOP ratio is fairly constant by household income quintile, though the highest income quintile spends a slightly larger percentage of their OASI income on medical OOP, likely because they have income outside of Social Security to support their other needs. Post-OOP ratios are slightly higher for the youngest retirees but generally do not vary much by age (in part because individuals who have spent any time in a nursing home are excluded from the analysis). The post-OOP ratio has historically been lower for those with at least one chronic health condition.

Post-OOP ratio before and after Part D. This project's results are similar to the Medicare Trustees Report: though OOP spending was on the rise until 2006, it has fallen slightly in real terms in more recent years. The results suggest that Part D is responsible. Prescription drug spending has fallen sharply since 2006 (in line with Akincigil and Zurlo 2015), and the groups that stood to gain the most from the introduction of Part D – those with no supplemental coverage and those with at least one chronic condition – saw the largest increases in the post-OOP ratio.

Conclusion

This project shows that only 75 percent of the average retiree's Social Security income remains after spending on medical care, after accounting fully for Medicare and supplemental insurance premiums, cost sharing, and any uninsured expenses. A substantial share of other households have even less of their benefits left over. Of course, retirees face budgetary pressure from other non-discretionary expenses as well; Farrell and Greig (2017) find that housing expenses, taxes, and non-housing debt represent about 30 percent of retirees' household income. Although OOP medical spending has declined somewhat since the introduction of Part D – as

well as the closing of the “donut hole” beginning in 2011 – these findings suggest that Social Security beneficiaries’ lifestyles remain vulnerable to a likely revival in medical spending growth.

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Does Public Health Insurance Affect How Much People Work?

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19th Annual Joint Meeting of the Retirement Research Consortium
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Washington, DC

The research reported herein was pursuant to a grant from the U.S. Social Security Administration (SSA), funded as part of the Retirement Research Consortium. The findings and conclusions expressed are solely those of the author and do not represent the views of SSA, any agency of the federal government, or the Center for Retirement Research at Boston College.

Most Americans get their health insurance through their employer, so they may be reluctant to leave a job if such a change affects their coverage. This situation is known as “job lock,” which may be a particular concern for those with health problems. As a result, expansions of public health insurance, which are not tied to a job, could reduce job lock and result in some workers scaling back from full- to part-time work or leaving the labor force entirely. This paper uses the introduction of Medicare Part D in 2006 to assess the extent to which the availability of drug coverage not tied to an employer induces older individuals to work less.

Background

Medicare has provided universal health insurance to all Americans ages 65 and over since 1966. However, it was only with the January 2006 introduction of Medicare Part D that the program began to cover prescription drugs.¹ Virtually all employer health insurance plans cover prescription drugs for their current employees (Kaiser Family Foundation, 2014). However, drug insurance options for retirees prior to Part D were limited if they did not have employer-provided retiree health insurance. This situation made them vulnerable to high drug costs if they left their employer plans. After 2006, they could get drug coverage through Medicare.

Data and Design

The data used in the analysis are from the *Health and Retirement Study*, a large panel of Americans over age 50 and their spouses. The survey started in 1992 and follows up with its subjects every two years.

The sample used in the analysis is restricted to individuals around age 65 (ages 55-68) and around the year 2006 (years 2000-2010). This restriction provides a group of individuals (55-64) who saw no change in their drug insurance availability and a group of individuals (65-68) who had no access to Part D coverage in 2000-2004 and acquired it in 2006-2010. This approach allows for an estimation of the effect of subsidized drug insurance on labor outcomes for individuals ages 65-68.

¹ Medicare did cover some drugs, such as those provided in hospitals, through Medicare Part A. Medigap and HMO plans covering drugs also existed but were chosen by only a small minority of those eligible.

Before 2006, not everyone faced an incentive to keep working in order to maintain insurance coverage. For example, workers at firms that did not offer employer-sponsored insurance certainly would not be affected by passage of Part D. To focus on a relevant population, the study restricts attention to individuals who have retiree health insurance (RHI) and divides them into two groups. The first is a treatment group made up of those who have RHI only until age 65 (14 percent of the total sample).² Before 2006, such individuals who retired at or after 65 would lose their drug coverage when they transitioned from their employer plan to Medicare. The only way to keep their drug coverage was to keep working. After 2006, they could keep their coverage past age 65 through Medicare regardless of when they retired.

The second group, which functions as a control group, is those who have RHI for life (12 percent of the total sample). They form a good control group, as they are quite similar to the treatment group. Both groups have RHI; they differ only in whether that insurance is limited to age 65 (treatment) or not (control). The control group is also observed at the same ages as the treatment group in the same years, so if something unobservable happens to change the labor outcomes of 65-68 year olds after 2006, they would experience that same shock and could be used to control for it.³

Results

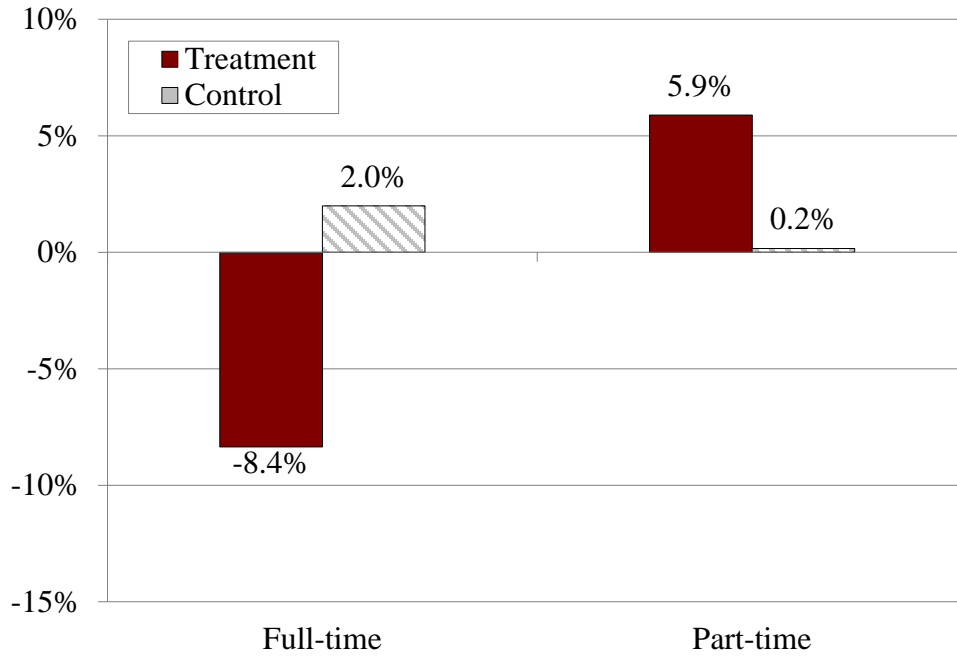
The Figure below shows the key estimation results for the effects of Part D on full- and part-time work. Part D led to a statistically significant decline of 8.4 percentage points in full-time work among individuals who were dependent on their employer insurance for drug coverage. The average full-time work rate at the baseline was 35 percent, so Part D led to a 24-percent reduction from that average. Of course, this result does not mean that all of the affected individuals moved into retirement. Instead, they may have shifted to part-time work.⁴ Indeed, part-time work did increase in the treatment group by 5.9 percentage points out of the 8.4-percentage-point overall effect. Thus, the reduction in full-time work can be decomposed into 70 percent switching into part-time work and 30 percent going into full retirement.

² This arrangement is fairly common, applying to about half of those with RHI, as everyone gains access to Medicare at age 65.

³ In practice, no such shock is found, and this control group merely serves to reinforce the validity of the estimates found in the treatment group alone.

⁴ Few employers offer health benefits to part-time workers (Kaiser Family Foundation, 2014), so the introduction of Part D could have made such a shift attractive to those ages 65 and over.

Figure. *Estimated Effect of Part D on Labor Outcomes for Treatment and Control Groups*



Note: Solid bars are statistically significant.

Source: Author's estimates from the *Health and Retirement Study* (2000-2010).

These results are driven almost entirely by less healthy individuals. Sick individuals (those with chronic conditions such as diabetes or heart disease) see a decline in full-time work of 12.2 percentage points and an increase in part-time work of 9.9 percentage points. In contrast, healthy individuals display no statistically significant response to Part D in their labor outcomes.

Overall, decoupling labor force decisions from insurance decisions can affect labor supply among those near retirement. This study finds that, prior to the availability of Medicare Part D, many individuals worked past age 65 to maintain access to their employer-sponsored drug insurance. While this barrier to retirement is relevant only to those who have such employer-sponsored insurance, which is a relatively modest share of the total population over age 65, it seems to provide a large incentive to delay retirement for this group.

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The Impact of Massachusetts Health Insurance Reform on Labor Mobility

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The Patient Protection and Affordable Care Act (ACA) of 2010 was based on the Massachusetts health insurance reform enacted in 2006. The focus of most research on the Massachusetts reform has been on its effects on health and health coverage. But its effect on labor markets should also be of primary interest. Critics have long maintained that the U.S. employer-sponsored health insurance system preserves inferior matches between employers and employees in cases in which workers are worried that if they leave a job, they would lose their employer health insurance. This phenomenon, known as “job-lock,” affects workers of all ages and can distort retirement decisions and reduce job turnover, among other labor market inefficiencies (Gruber and Madrian 2004).

This study examines the effect of the Massachusetts health reform on job mobility and employment exits. It takes advantage of administrative data with larger sample sizes than are available in public-use datasets, allowing the analysis to detect the influence of policy on even a fairly low probability event such as a job transition or labor force exit. Using a difference-in-differences approach, this paper assesses the impact of the Massachusetts health insurance reform in 2007 on job mobility and exits from employment. The estimates for Massachusetts help to clarify the effects of the ACA, since the national, all-at-once rollout of most of the ACA makes evaluating its effects on job mobility hard to identify.

Data and Methodology

This project uses administrative data from the U.S. Social Security Administration’s Continuous Work History Sample merged with the Longitudinal Employee-Employer Data File for the years 2000-2011. These two datasets link a 1-percent sample of earnings and beneficiary records to a worker’s state of residence and information on his primary employer.

The analysis examines whether prime-age individuals are more likely to move between employers, in particular from large to small firms, after implementation of the Massachusetts health insurance reform. It also examines whether workers, and in particular older individuals (ages 55-65), are more likely to exit employment. The analysis estimates difference-in-differences regressions, comparing the change in the rate of switching employers or exiting employment in Massachusetts before and after 2007 to the change in these same variables over the same time period in New York and the other New England states (excluding Vermont, which also reformed its health insurance market during this time). Job-lock theory suggests that the

reform should increase employer changes, transitions from large to small firms that are less likely to provide employee health coverage (conditional on changing jobs), and employment exits, and reform should decrease transitions from small to large firms (conditional on changing jobs).

Results

Trend analysis and regression estimates indicate that Massachusetts residents were actually less likely to move to new employers after the reform, relative to workers in neighboring states that did not make structural changes to their health insurance markets. The rate of changing employers was lower in all states after reform – in part due to the Great Recession – but was particularly low in Massachusetts, contrary to the prediction of the job-lock model.

Massachusetts workers were also less likely to move from large firms, which likely offered insurance, to small firms – again, the opposite of what was expected. For the full sample period, Massachusetts workers were more likely to make this transition compared to residents of the other Northeastern states. But the gap with other states closed after reform – the interaction coefficient is negative and statistically significant and of almost the same magnitude as the Massachusetts indicator without an interaction. Also, small-firm workers do not appear to have reduced their probability of switching to large firms after reform, providing little evidence that jobs were “unlocked.”

The reform was also expected to free up workers to leave the labor force, but estimates indicate it generally had no statistically significant effect on employment exits.

All of the results are similar by age. After reform, older Massachusetts workers were less likely to change employers and less likely to move from large to small firms (conditional on changing employers) than older workers in the rest of the Northeast. Older Massachusetts workers also showed no difference in the probability of moving to a large firm or exiting employment.

Conclusion

The Massachusetts health reform and the ACA were both expected to reduce job-lock, resulting in increased employer mobility, especially to small firms, and more employment exits. This study finds very little evidence that Massachusetts’ reform eased job-lock. By some

definitions of firm size, older workers decreased the rate at which they moved to large firms, as predicted. But most of the predictions about labor market mobility did not come to pass: employer transition rates decreased more in Massachusetts than in neighboring states, as did transitions from large to small firms and transitions out of employment altogether.

On the whole, the results suggest that: 1) job-lock was not tying workers to unproductive jobs in Massachusetts to the extent that earlier research had suggested; 2) the Massachusetts reform may not have eased workers' concerns about access to health insurance enough to make them consider changing jobs or leaving employment; or 3) the premiums, even when subsidized, for plans purchased on the Connector (Massachusetts' insurance exchange) did not make individual coverage attractive enough relative to employer-sponsored insurance to ease job-lock. While the null result runs contrary to well-established labor economic theory, it is consistent with recent literature, including the initial results from the ACA (e.g., Kaestner et al. 2015). The recent spate of null results suggests that COBRA and HIPAA may have reduced job-lock to the point where it would be hard to detect in policies that further increased access outside of the worker's current employer. In the case of the ACA in particular, null results are likely related to the uncertainty surrounding the law's permanence and concerns that the plans available on the exchange would not match employer-sponsored insurance in price and quality.

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Panel 3: What Challenges Do People Face in Managing Their Money?

Dementia, Help with Financial Management, and Financial Well-Being

Geoffrey T. Sanzenbacher and Anek Belbase (Boston College)

Discussant: Padmaja Ayyagari (University of South Florida)

Retirement Prospects for Millennials: What Is the Early Prognosis?

Richard W. Johnson, Karen E. Smith, Damir Cosic, and Claire Xiaozhi Wang (Urban Institute)

Discussant: Sean Huang (Georgetown University)

When Is It Hard to Make Ends Meet?

Brian Baugh (University of Nebraska, Lincoln), Jesse B. Leary (Financial Conduct Authority), and Jialan Wang (University of Illinois at Urbana-Champaign)

Discussant: Benjamin J. Keys (Wharton School, University of Pennsylvania)

Dementia, Help with Financial Management, and Financial Well-Being

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To prevent financial exploitation, Social Security allows beneficiaries who cannot manage their own benefit to relinquish control to a representative payee. Once designated, a representative payee is required to decide how to spend a beneficiary's Social Security income and to keep records of that spending. Most of the Representative Payee Program's 5.5 million participants are children or disabled adults.¹ However, just over 500,000 retirement beneficiaries have a representative payee as well. While this may sound like a large number of retirees with payees to some, it means just 1.5 percent of retirees have a payee despite the fact that around 10 percent have dementia.² This seeming imbalance has led some observers to suggest that SSA should cover more retirees under the Representative Payee Program.³

However, dementia poses a unique challenge to the Representative Payee Program, since some individuals with dementia are still capable of receiving and managing their own benefits, while others are not.⁴ Simply assuming that those with dementia need a payee risks taking away someone's independence prematurely. The difference between needing a payee or not often comes down to the quality of a person's informal care network.⁵ Although almost all people with common forms of dementia will eventually lose the ability to manage their finances, initially, caregivers can make decisions jointly before permanently "taking the keys away" as impairment becomes more severe. Therefore, to evaluate how well the Representative Payee Program is serving the population in need, SSA needs to understand informal care networks.

Belbase and Sanzenbacher (2016), using the HRS linked to Social Security administrative data, find that most people have some other source of assistance available. Over 95 percent of beneficiaries with dementia either have a representative payee, have a non-impaired spouse or child, have given someone power of attorney, or live in a nursing home where they often do not need to manage their finances. Thus, very few retirees are in the vulnerable position of living in the community without some sort of assistance available. But while this existing research suggests that most retirees with dementia potentially have access to sources of help, because of data limitations it is not known whether these helpers actually assist in managing finances and, if so, whether the assistance prevents misuse or abuse of financial resources.

¹ Over 3 million SSI recipients also have a representative payee.

² Anguelov, Ravida, and Weathers II (2015) and Herbert et al., (2013).

³ For example, a 2010 audit by the Office of the Inspector General found retirees over age 85 in need of a payee, and some experts have argued that the process that field offices use to determine financial capacity tends to err on the side of finding someone capable rather than incapable (National Academy of Sciences, 2016).

⁴ See Marson et al. (2009).

⁵ See Arias (2013) and Berry, Apesoa-Varano, and Gomez (2015).

The Current Study

To fill this gap in the literature, this study uses data on more than 7,000 Medicare enrollees participating in the *National Health and Aging Trends Study* (NHATS) to examine the role of informal helpers in managing money for people with dementia. Since 2011, the NHATS has conducted annual, in-person interviews to capture trends in late-life functioning. The dataset provides a comprehensive view of how older adults adapt to the changes associated with aging by capturing variables on economic and psychological well-being, difficulty carrying out daily activities, and help or accommodations made to carry out those activities.

To identify respondents with cognitive impairment and dementia, this study relies on the methodology of Kasper et al. (2013). Recognizing that the NHATS (like most publicly available microeconomic datasets) does not contain medical diagnoses of dementia, Kasper et al. (2013) create an algorithm using the self-reported diagnosis of dementia, results of a dementia screening interview, and cognitive test scores to classify people as either having “no dementia,” “possible dementia,” or “probable dementia.” This paper takes an extra step and identifies people as having “established dementia” (and a high likelihood of needing financial assistance), based on the frequency with which they are assigned “probable dementia” during their time in the NHATS.

Once an individual is identified as having “established dementia,” this paper uses detailed questions on the help that caregivers provide to examine whether individuals in a retiree’s caregiving network provide assistance with simple financial matters like bill paying and with more complex money matters like managing retirement accounts. The paper also examines how the help received from informal caregivers affects the financial and psychological well-being of retirees with dementia.

Results

The paper has four key findings. First, over 85 percent of those with established dementia are receiving help with both simple and complex money matters. Second, as people transition from normal cognition to dementia, any source of financial assistance shifts from spouses to children – often daughters. Third, those with established dementia who receive help face fewer issues paying for food, rent, utilities, and medical expenses and also experience less

anxiety compared to those with established dementia who manage their finances without help. Indeed, those with established dementia and a source of financial management assistance appear as well off along these dimensions as those without any dementia. Fourth, while this study does not definitively establish a causal link between help with financial management and well-being, the beneficial effect of help with financial management persists even after controlling for a number of other factors that could explain the correlation (such as income, education, and health).

These findings offer a mostly positive view of how financial management is working for those with established dementia. Although earlier research showed most people do not use a representative payee, most do seem to have help available both for their simple banking matters and more complex money management. Perhaps just as importantly, the study suggests that those with established dementia and help available are faring as well as those without any cognitive impairment. This finding should lessen the concern that a high proportion of caregivers are taking advantage of their charges. While informal caregivers can and do sometimes financially exploit beneficiaries, this study suggests that, on average, receiving help managing finances is related to higher well-being among people with late-stage dementia relative to those not receiving help.

Still, some reason for concern exists. The 15 percent of those with established dementia and without help appear significantly worse off. The paper finds that these individuals are nearly twice as likely as those without dementia to have trouble paying for food, rent, utilities, and medicine. Individuals who have been divorced or widowed, or whose spouses have become impaired, are especially vulnerable to being in this situation, especially if their children do not live nearby. It may be helpful for policymakers and social workers to be aware of these individuals and improve targeted outreach to them to ensure Social Security benefits are properly managed.

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Retirement Prospects for Millennials: What Is the Early Prognosis?

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Retirement financing in the United States has changed significantly over the past five decades. Social Security and private sector pension coverage expanded in the 1950s and 1960s but then contracted in later decades. Benefit formula changes in the 1970s reduced later payouts, and the 1983 Social Security amendments began raising the program’s Full Retirement Age in 2000, essentially cutting benefits. Over the last 30 years, private sector employers have been steadily moving away from defined benefit (DB) pensions to defined contribution (DC) retirement plans that shift much of the responsibility for retirement saving from employers to employees, reducing retirement wealth for many workers. Since about 1990, many employers have also been cutting or eliminating retiree health benefits, raising families’ out-of-pocket health care burden in later life. Moreover, recent economic trends such as stagnating wages, long-term unemployment, declining saving rates, and increasing debt – more of which is being carried into retirement – also shape wealth accumulation and retirement saving. Declining homeownership and mounting debt are especially concerning for the future retirement well-being of Generation Xers and Millennials.

Some previous studies evaluating retirement prospects for current and future retirees have concluded that younger cohorts are at greater risk than older generations of being unable to maintain their living standard in retirement. Other observers, however, point to more promising trends, such as the increasing earnings of women, that might mitigate retirement risks. How later generations will fare in a changing retirement environment – one with higher life expectancy, potentially less generous Social Security benefits, and more reliance on “do-it-yourself” private retirement plans – will depend largely on their preferences and attitudes toward saving.

This report used recent historical survey data and a dynamic microsimulation model to assess retirement prospects for future generations, with a special focus on the Millennial generation. Because retirement outcomes depend on how much people earned and saved when they were younger, much of our analysis compared trends in employment, earnings, pension coverage, and wealth during working ages across cohorts. Working-age outcomes that have already occurred factor into the retirement income projections generated by our microsimulation model. Although Millennials generally include those born between 1980 and 2000, we excluded from our analysis people born after 1990, because their labor market experience is too thin to draw firm conclusions about their long-term earnings potential and capacity to save for retirement.

Methods

We used household survey data from the *Current Population Survey's* (CPS) Annual Social and Economic (ASEC) supplement and the *Survey of Consumer Finances* (SCF) spanning many decades to examine long-term trends in demographic and economic outcomes. Although the surveys do not follow the same households over time, we were able to create synthetic cohorts by combining information from interviews completed in various years by respondents born in the same period and comparing aggregate outcomes across cohorts at various ages. With CPS/ASEC data from 1966-2016, we created synthetic five-year cohorts for the birth years 1941-1945 through 1986-1990. Members of our youngest cohort were ages 26-30 in 2016, and members of our oldest cohort were ages 21-25 in 1966. We used CPS/ASEC data to examine trends in educational attainment, labor force participation, marriage rates, homeownership rates, and, for full-time workers, median earnings and participation rates in employer-sponsored retirement accounts. With SCF data from 1983-2013, we created synthetic six-year cohorts for the birth years 1928-1933 through 1976-1981. Members of our youngest SCF cohort were ages 32-37 in 2013, and members of our oldest cohort were ages 56-61 in 1983. We used SCF data to examine trends in household wealth.

To project retirement incomes for Baby Boomers, Gen Xers, and Millennials, we used DYNASIM4, a dynamic microsimulation model designed to analyze the long-run distributional consequences of retirement and aging issues. The model starts with a representative sample of individuals and families and ages them year by year, simulating key demographic, economic, and health events. For example, DYNASIM4 projects that, each year, some people in the sample get married, have a child, or find a job. The model projects that other people become divorced or widowed, stop working, begin collecting Social Security, become disabled, or die. These transitions are based on probabilities generated by carefully calibrated equations estimated from nationally representative household survey data. The equations account for important differences in how likely various experiences are, depending on gender, education, earnings, and other characteristics. Other equations in DYNASIM4 project annual earnings, savings, and home values. The model uses program rules – combined with projections of lifetime earnings, disability status, and household income and wealth – to project Social Security retirement, disability benefits, and Medicaid coverage. For consistency with Social Security's projections

about system finances, we generally use the same assumptions as the Social Security and Medicare trustees.

Selected Results

Our results suggest that Millennials' retirement security will be shaped by many of the same forces that are already beginning to buffet the financial security of current retirees, including the erosion of traditional DB pension plans and rising debt levels. So far, outcomes for Millennials are not dramatically worse than those for previous recent cohorts, although the steady generational improvement in economic status that defined American society in the middle of the 20th century appears to have ended, at least for now. Men's labor force participation rates continue to decline before age 55 and their median wage remains stagnant. Gen X and Millennial women are earning more than the Boomers did, but Millennials are not earning more than Gen Xers. In terms of household wealth, people born after 1970 are not accumulating wealth any faster than those born in the 1960s, reversing the generational growth experienced by earlier cohorts, and Millennials are less likely to own a home than earlier generations. However, the collapse in home prices and the stock market in the late 2000s complicate these generational comparisons. The most encouraging development for Millennials is the growth in college graduation rates, which raises their future earnings potential.

Our projections show that median, age-70 income will be higher for Millennials than previous generations, but a greater share may experience falling living standards when they stop working. Using a measure of retirement income that includes payouts that could be collected from an actuarially fair annuity valued at 80 percent of a retiree's financial assets and retirement accounts, we find that 41 percent of 70-year-olds born between 1976 and 1985 would be unable to replace at least 75 percent of the inflation-adjusted average annual earnings they and their spouse received from ages 50-54. By comparison, replacement rates at age 70 would likely fall short of the 75-percent threshold for 38 percent of those born between 1966-1975 and 33 percent of those born between 1956-1965, 1946-1955, and 1936-1945. These projections are sensitive to our assumption about future wage growth.

When Is It Hard to Make Ends Meet?

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Since 1997, the Social Security Administration (SSA) has disbursed Old Age, Survivor and Disability Insurance (OASDI) payments on the second, third, or fourth Wednesdays of each month, depending on the beneficiaries' date of birth. This schedule generates pay periods that are either 28 or 35 days long. This study examines the effects of the Wednesday payment schedule on the financial behavior and financial health of OASDI beneficiaries. First, we find that beneficiaries are significantly more likely to experience financial shortfalls during 35-day versus 28-day pay periods. Second, we find that beneficiaries are more likely to experience shortfalls if they have a greater timing mismatch between their benefits income and their due dates for mortgage, auto, and credit card payments. The results suggest that policies and technologies that help consumers align the timing of their income and expenditures could improve financial health.

Data, Methods, and Results

We assess the effects of the Wednesday OASDI disbursement schedule on several measures of financial health from two distinct datasets. Our first dataset comes from an online account aggregator, a free service that allows users to link and monitor their financial activities across multiple financial accounts. We identify about 34,000 beneficiary households that are paid on one of the three Wednesday schedules among the set of users of this aggregation service. For these households, we observe details of their bank and credit card transactions, including transaction dates, descriptions, and amounts. Our second dataset is an anonymized administrative dataset collected by the Consumer Financial Protection Bureau that includes storefront payday loans made by several large lenders. We identify several tens of thousands of OASDI beneficiaries paid on Wednesdays by matching their reported income sources with the SSA disbursement calendar. For each loan, we observe the principal and fee amounts, origination dates, payment due dates, and actual payment dates.

Our key measures of financial health are the propensity of beneficiaries to experience bank overdrafts, bounced checks, and online and storefront payday loans on a given day. On an average day, Wednesday group beneficiaries have a 0.7-percent probability of experiencing an overdraft, an 0.2-percent probability of having a bounced check, and 0.01- and 0.05-percent probabilities of taking out online and storefront payday loans, respectively. While these are not

high probabilities on a daily basis, a given household has more than a 13-percent chance of experiencing one of these types of financial shortfalls in an average month.

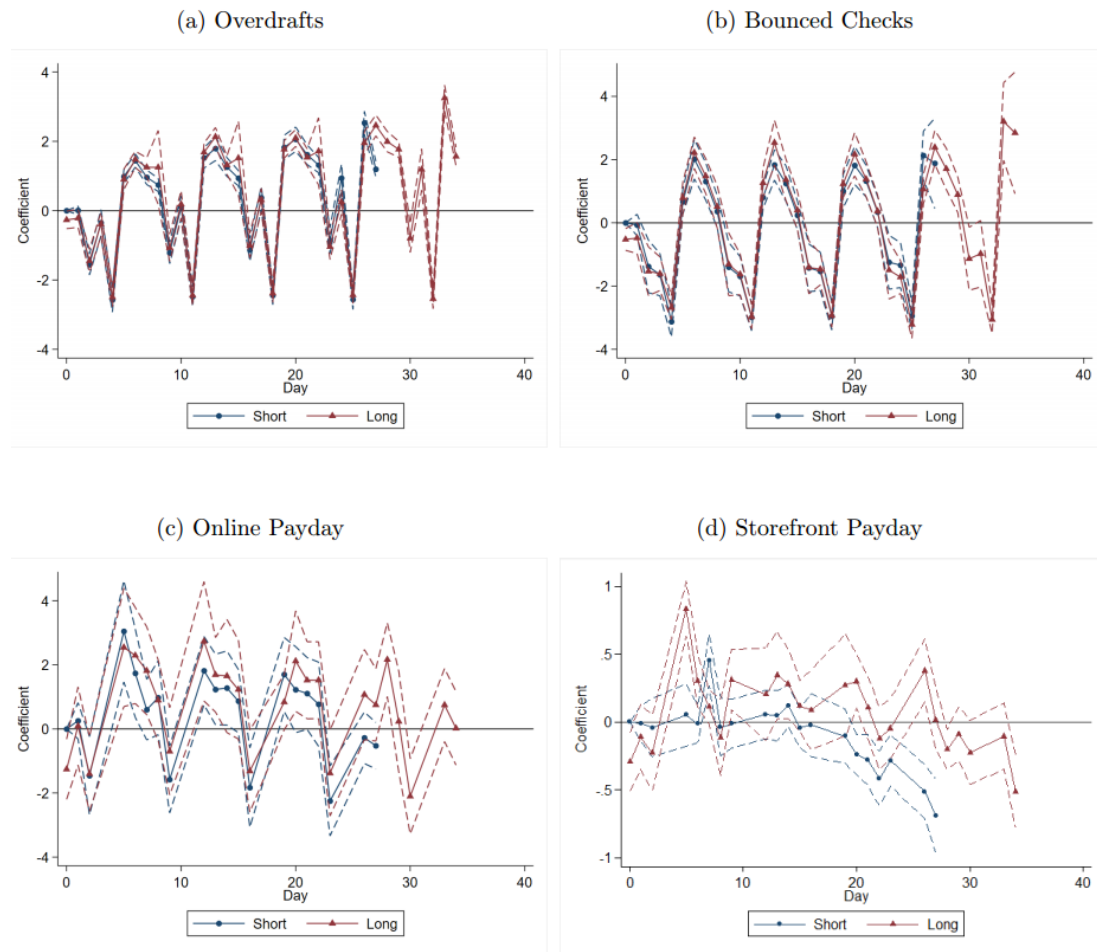
As shown in Figure 1, the incidence of financial shortfalls is significantly higher during long (red triangles) versus short (blue squares) pay periods. Households are 5 percent more likely per day to experience an overdraft during 35-day pay periods compared with 28-day pay periods. They are 3 percent more likely to experience a bounced check, 16 percent more likely to take out an online payday loan, and 31 percent more likely to take out a storefront payday loan. Beneficiaries paid near the end of the month are also in better financial health than those paid in the middle of the month.

Relative to the second Wednesday group, those in the fourth Wednesday group are 3 percent less likely to overdraft, 10 percent less likely to have a bounced check, 14 percent less likely to take out online payday loans, and 4 percent less likely to take out storefront payday loans. We find evidence that the differences in financial health across the three Wednesday groups – who have otherwise identical economic circumstances – are driven by the mismatch in timing between their benefits payments and monthly mortgage, auto, and credit card payments. Despite these findings, we find that beneficiaries are unlikely to adjust the due dates for their monthly expenditures to better align with their incomes – either because they do not want to, because they are not able to, or both.

Implications

Our results highlight the need for better policies and tools to help consumers match the timing of their income and expenditures. Such tools, which are increasingly available through traditional banks, payroll providers, and financial technology firms, could help consumers avoid high-cost borrowing and other costs of financial shortfalls. These innovations would be especially beneficial for vulnerable households, such as those who depend on SSA benefits. The results of this project are not only relevant for the OASDI benefits disbursement system, but may also help inform the impacts of income timing for other benefits programs administered by SSA and other state and federal agencies.

Figure 1. *Financial Shortfalls Over Short and Long Pay Periods*



Note: Figure shows the percentage difference in the incidence of financial shortfalls relative to the first day of the pay period for short pay periods.

Panel 4: How Do Family Ties Affect Retirement Security?

Financial Well-Being in Late Life: Understanding the Impact of Adverse Health Shocks and Spousal Deaths

James Poterba (MIT and NBER) and Steven Venti (Dartmouth College and NBER)

Discussant: Christopher R. Tamborini (U.S. Social Security Administration)

Parents with an Unemployed Adult Child: Labor Supply, Consumption, and Savings Effects

Kathryn Anne Edwards and Jeffrey B. Wenger (RAND Corporation)

Discussant: Stephanie Rennane (RAND Corporation)

Transfers, Bequests, and Human Capital Investment in Children over the Lifecycle

Eric French (University College London) and Andrew Hood and Cormac O’Dea (Institute for Fiscal Studies)

Discussant: Michael Davis (T. Rowe Price)

**Financial Well-Being in Late Life:
Understanding the Impact of Adverse Health Shocks and Spousal Deaths**

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The risk of substantial late-life health expenditures is often cited as a primary rationale for maintaining a stock of precautionary savings in retirement. The realization of such risks is also a potential contributor to low levels of wealth for some elderly households. This paper uses data on the over-65 population drawn from 10 waves of the *Health and Retirement Study* (HRS) spanning the 1996-2014 period to explore the role of health expenditure shocks in contributing to the draw-down of retirement wealth. Our strategy is to document the association between wave-to-wave changes in net worth and health conditions that are newly diagnosed between waves. The health conditions we consider include stroke, cancer, and lung disease; we also investigate health-related events such as a hospital stay, a nursing home stay, or – for married individuals – the loss of a spouse. Our net worth measure includes home equity and the net value of other real estate, business assets, and financial assets. IRA, 401(k) and Keogh balances, when available, are included in financial assets. We use household rather than individual balance sheet measures because it is often difficult to assign ownership of housing or jointly held financial assets to individuals within a couple.

We begin by computing the probability of various health-related shocks at the household level. In this analysis, we consider a married HRS respondent to have “experienced a stroke” if she or her husband had a stroke between two waves of the HRS. The most common health shock is a new diagnosis of arthritis. On average, every two years, 14.7 percent of the HRS respondents who did not previously report a diagnosis of arthritis indicate that they or their spouse have been diagnosed with this condition. Arthritis is followed by hypertension (13.8 percent), cancer (4.9 percent), diabetes (4.3 percent), stroke (3.8 percent), psychiatric problems (3.3 percent), lung disease (3.0 percent), and heart attack (2.8 percent). The probability that a married individual over age 65 will report the death of a spouse averages 4.5 percent every two years; the chance of any hospital admission is 43.1 percent and of any nursing home stay is 8.9 percent.

We also compute the probability that a 65-year-old who has never had a particular medical condition will experience that condition in his or her remaining lifetime. This calculation focuses on the individual and ignores diagnoses affecting the spouses of married respondents. We estimate the lifetime probability of being diagnosed with arthritis to be 54.8 percent for a 65-year-old, arthritis-free woman and 46 percent for a man. For stroke, 24.1 percent for a woman and 21.3 percent for a man. For lung disease, 17.5 and 17.8 percent,

respectively. Because our calculations omit respondents who had already been diagnosed with these conditions by age 65, they understate the fraction of the over-65 population that will experience these conditions.

We find mixed associations between new health diagnoses, health events, and the inter-wave change in net worth. For six of the eight conditions we consider, we cannot reject the null hypothesis that net worth is unaffected by a new diagnosis. These results may be due to the modest cost of treating some conditions, such as arthritis and hypertension, or to the near-universality of Medicare, or to the presence of other health insurance coverage for many respondents, or to our focus on the costs within the first two years of diagnosis, which may substantially understate the cost of chronic conditions.

For two conditions, stroke and lung disease, we find substantial declines in net worth following the diagnosis: just over \$25,000 for a stroke and \$29,000 for lung disease. These estimates are based on a specification that accounts for heterogeneity across individuals in the level of net worth, “fixed effects,” but assumes similar trends in the changes in wealth for those who do, and do not, experience new health conditions. When we instead assume that there are persistent individual differences in wealth changes, the drop in net worth associated with these two conditions rises to over \$48,000 (stroke) and \$41,000 (lung disease). For a hospital or nursing home stay and the loss of a spouse, the correlation with changes in net worth is also sensitive to our econometric specification. With fixed effects for wealth levels, a hospitalization is associated with a \$7,600 drop in net worth. A nursing home stay corresponds to a \$15,000 drop and the loss of a spouse to \$24,000. With person-specific trends in net worth, however, we can no longer reject the null hypothesis that any of these events is associated with a change in net worth.

We next calculate the expected reduction in wealth that a 65-year-old individual would face over his or her remaining life years for each potential health shock. This calculation involves the probability that the individual will survive to each advanced age, the probability that a new shock will be experienced at each age, and the discounted decline in net worth associated with each shock. Using our estimates of the cost of shocks from the fixed effects specification, we estimate the expected “wealth cost” of a stroke for a married (single) man at age 65 to be \$8,414 (\$7,611). For women, the analogous values are \$5,741 (married) and \$3,621 (single), representing both a lower likelihood of stroke and a smaller wealth decline conditional on a

stroke. We estimate that the expected cost of a hospital stay, in terms of reduced net worth, is about \$15,000 for single individuals at age 65 and more than \$33,000 for married men and women. Adding up the expected costs of the five shocks for which we find substantial declines in net worth – stroke, lung disease, hospital stay, nursing home stay, and death of a spouse – we estimate the average “wealth cost” of the health shocks we consider to be about 9 percent of household net worth at age 65 for married individuals and for single men, but higher – about 22 percent of net worth – for single women at 65, largely because of the lower wealth level of this group.

**Parents with an Unemployed Adult Child:
Labor Supply, Consumption, and Savings Effects**

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Aging individuals face several sources of risk, which include health shocks, unemployment shocks, and retirement savings shocks. For some older adults, these risks alone comprise profound retirement savings challenges – how they manifest and how well they are insured against can influence behavior before retirement or change the timing of retirement. For some older parents, however, these risks may be accompanied by unexpected adverse labor market shocks to their children. In this paper, we investigate if the labor market shock of a child is a source of additional risk to the parent.

To study this issue, we use data from the *Panel Study on Income Dynamics* from 1968-2013. We match parents to their children and observe both concurrently. Due to low match rates, fathers are excluded. The longitudinal data allow for identification to come from within-mother variation in having an unemployed adult child. Our basic strategy is to regress mothers' outcomes on the unemployment of a child. We include in our analysis individual, year, and age fixed-effects, which control for unobserved individual, time-period, and life-cycle characteristics of the mothers that could be correlated with the job loss of a child.

The outcomes of interest for the mother fall into four broad categories: transfers, income, consumption, and savings. Simply, we investigate if there is evidence that mothers provide financial support to unemployed children (transfers) and how that support may be financed (from income, consumption, or savings). We divide mothers into three age groups: pre-retired (less than 62 years old); retirement window (62-70 years old); and retired (70 years and older).

From our regressions, we find that, across all three groups of mothers, there is a positive and precisely estimated increase in the dollar amount of money sent to children in the year they have an unemployed child. Further, we find that all three age groups of mothers also report a decrease in their usual food consumption in the year of a child's unemployment spell. For younger, pre-retired mothers, we estimate a concurrent increase in labor force participation on the intensive margin in the year of a child's spell. The estimated coefficient, an increase in the weeks worked per year, is driven by mothers who are already working, rather than joining the labor force. Younger working mothers also report a significant decrease in the share of their salary contributed to a pension in the year of a child's spell. There is no discernible effect on the transition to retirement or Social Security claiming for mothers in the retirement window, though there is evidence that they increase their saving. Older, retired mothers, who are not working

and are often on a fixed income, see no change in outcomes outside of the drop in usual food consumption.

Our estimates can be considered causal to the extent that the unemployment spell of an adult child is exogenous to the mother. Through various iterations, we impose restrictions on the child's unemployment – that it must be preceded and followed by employment, that it must not be concurrent with the birth of a new child, that it must be due to a layoff or firm closing – that lend to stronger or weaker causal claims. We also examine the relative situation of the unemployed children: their age, educational attainment, marital status, the presence of children, and the number of siblings. Although the restrictions on the nature of the spell make little difference to our estimates, we find that many of our results are driven by younger, unmarried, childless children.

The upshot of our findings, when all categories of outcomes are combined, is that the observed financial assistance is far less than the observed changes in income, consumption, and savings. This implies that there is assistance we do not observe, that the child's unemployment spell induces behavioral changes beyond financing assistance, or both.

Transfers, Bequests, and Human Capital Investment in Children over the Lifecycle

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Motivation and Contribution

Intergenerational links are a key determinant of levels of inequality and social mobility, with previous work – which looked at a range of developed economies – finding very significant intergenerational correlations in education, incomes, and wealth. Understanding the drivers of this persistence of economic outcomes across generations is crucial for the design of redistributive tax and transfer policies. In this paper, we focus on the quantitative effects on inequality over the life-cycle of three different types of parental investments in children: 1) time investments during childhood and adolescence that aid child development, and in particular cognitive ability; 2) educational investments that improve school quality, and hence educational outcomes; and 3) cash investments in the form of inter-vivos transfers and bequests.

We use unique U.K. data that has followed a cohort of individuals from birth to retirement to document the evolution of inequality over the life-cycle. A “back-of-the-envelope” calculation focusing on men in this cohort suggests that nearly 40 percent of the differences in average lifetime incomes by paternal education are explained by ability at age 7, around 40 percent by a subsequent divergence in ability and different educational outcomes, and around 20 percent by the inter-vivos transfers and bequests received so far.

Data and Descriptives

The key data source for this paper is the *National Child Development Study* (NCDS). The NCDS follows the lives of all people born in England, Scotland, and Wales in one particular week in March 1958. The initial survey at birth has been followed by subsequent surveys at the ages of 7, 11, 16, 23, 33, 42, 46, 50 and 55. We supplement the NCDS with data from the *English Longitudinal Study of Ageing* on the inheritances received by this cohort. Key descriptive findings include:

- By the age of 7, ability gaps between those with higher- and lower-educated parents have already opened up considerably. These differences in measures of cognitive ability continue to widen to the age of 16. At the same time, higher-educated parents are significantly more likely to invest time in their children (reading to them regularly, taking an interest in their education, taking them on outings).

- There is a strong intergenerational correlation in educational attainment: while 66 percent of those with a college-educated father also attend college, that figure falls to 20 percent of those with the lowest-educated fathers. Fifty percent of those whose fathers attended college go to the schools in the top 20 percent by quality (as measured by the proportion of students who continue beyond the compulsory leaving age), compared to 15 percent of those with low-educated fathers.
- Bequests are both more common and substantially larger, on average, for those with higher-educated parents. Those with college-educated fathers have inherited around \$40,000 more than those with low-educated fathers, with many of the parents of this cohort still alive.
- Table 1 summarizes differences in lifetime income across education groups.

Table 1. *Decomposition of Differences in Lifetime Income by Father's Education*

	Father's education	
	Some post-compulsory	Some college
Ability at age 7	£65,000	£115,000
Evolution of ability from 7 to 16	£53,000	£80,000
Education conditional on ability	£17,000	£59,000
Inter-vivos transfers and bequests	£24,000	£37,000
Total difference	£159,000	£291,000

Note: Differences relative to those with low-educated fathers (compulsory education only). Figures calculated for men.

Reduced-form Evidence on the Return to Parental Investments

In Section 3 of the paper, we look more formally at the relationship between parental time investments and the evolution of ability with age, and the relationship between school quality and educational outcomes. We find that:

- Our composite measure of time investments has a significant effect on changes in ability over time, even after conditioning on background characteristics. A one-standard-deviation increase in time investments at age 7 raises age-11 ability by 0.14 of a standard deviation, and a one-standard-deviation increase in time investments at age 11 raises age-16 ability by 0.09 of a standard deviation.

- Our measure of school quality does have a role in driving educational outcomes over and above ability, but that impact is relatively small. Compared to attending a school in the bottom 20 percent of the school quality distribution, attending a school in the top 20 percent of the quality distribution raises the probability of college education by around 7 percentage points on average, compared to a 22-percentage-point increase from each standard deviation of normalized age-16 ability.

Model

Section 4 of the paper outlines a multigenerational dynamic model of consumption and labor supply in which parents can make different types of transfers to their children. Parents are altruistic toward their children and can make time investments (which affect the child's ability) and educational investments (which affect educational outcomes) and can transfer cash, in the form of inter-vivos transfers and bequests. The child's future earnings depend on their ability and their educational outcomes. The model hence captures the trade-offs parents face between their own consumption and leisure (from which they derive utility) and investments of these different forms in their children that would increase their children's welfare.

The model can be used to: 1) evaluate how particular intergenerational transfers affect household behavior; 2) compare the relative insurance value of these types of transfers; and 3) simulate household behavior and welfare under counterfactual policies (for example, under reforms to estate taxation).

Policy Implications

The paper shows that policymakers interested in tackling the intergenerational transmission of inequalities need to consider policies designed to counter the inequality-increasing effects of each of the three forms of parental investment, since each is quantitatively important in driving inequalities in income. Moreover, policymakers should bear in mind the substitutability of these different forms of investment – any attempt to shut down one channel of parental investments may provoke a shift toward investment in other forms.

The findings of this paper have a number of more specific implications for tax and transfer policies. For example, redistributive transfer programs are often explicitly justified as providing insurance against health, unemployment, and other shocks. This paper suggests that

these policies also provide insurance against parental characteristics, which are an uninsurable risk from the perspective of the child. Balanced against this insurance motivation, we find that many of these differences across the education gradient come from active investments on the part of high-education parents. Tax policies that reduce inequality likely will reduce parental investments. Our model will allow us to characterize these trade-offs.

Panel 5: What Factors Affect Asset Accumulation?

Homeownership, Social Insurance, and Old-Age Security in the United States and Europe

Barbara A. Butrica and Stipica Mudrazija (Urban Institute)

Discussant: Stephanie Moulton (The Ohio State University)

Optimal Illiquidity

John Beshears (Harvard University and NBER), James Choi (Yale University and NBER), Christopher Clayton (Harvard University), Christopher Harris (University of Cambridge), and David Laibson and Brigitte C. Madrian (Harvard University and NBER)

Discussant: David P. Richardson (TIAA Institute)

Can Knowledge Empower Women to Save More for Retirement?

Drew M. Anderson (University of Wisconsin-Madison, Steven H. Sandell Scholar) and J. Michael Collins (University of Wisconsin-Madison)

Discussant: Judy Dougherty (Prudential Financial)

Homeownership, Social Insurance, and Old-Age Security in the United States and Europe

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Relatively few Americans have accumulated substantial savings outside of their employer-sponsored retirement plans, yet most own their homes. Thus, the traditional view of the retirement income system as a three-legged stool supported by Social Security, private pensions, and savings may be better viewed as one supported by Social Security, pensions, savings, and homeownership.

Due to country-specific economic, social, and political developments throughout modern history, homeownership rates and the relative importance of homeownership for old-age security vary widely across developed countries. Many countries, however, are increasingly promoting homeownership as an effective way of building assets, a de facto self-insurance mechanism for old-age security, and a (partial) substitute for various social transfers.

In this context, this study compares the United States with nine European countries – Austria, Belgium, Denmark, France, Germany, Italy, the Netherlands, Spain, and Sweden – to better understand the role of homeownership in retirement security. More specifically, our research objectives in this paper are to: 1) compare trends in homeownership rates among older adults in the United States and Europe before and after the Great Recession and provide a comparison of the key characteristics of housing-related policies across countries; 2) examine home equity trends among older homeowners in the United States and Europe, the relative importance of housing as a source of retirement wealth, and cross-national differences in the prevalence and burden of housing debt; 3) provide an overview of equity release options and estimate how much older homeowners could increase their household incomes by fully monetizing their housing equity; and 4) critically discuss the prospects for, and limits of, home equity release and asset-based welfare policies.

Our results show that while the majority of older adults are homeowners, homeownership varies substantially across countries due to a complex mix of socioeconomic, political, and historical circumstances that shaped housing preferences and tenures in different societies. However, older adults' homeownership rates generally increased between 2006 and 2012 across all the countries in our study. Our analysis of housing-related policies shows that countries such as the Netherlands, Sweden, and Denmark provide comparatively high levels of support to both homeowners and non-homeowners, while southern European countries such as Italy and Spain are at the opposite end of the spectrum. The United States exhibits the greatest imbalance of all

observed countries between policies supporting homeowners and non-homeowners, with some of the highest levels of support for homeowners and lowest levels of support for non-homeowners.

Our analysis of data from the *Health and Retirement Study* (HRS) and the *Survey of Health, Ageing, and Retirement in Europe* (SHARE) on home equity trends among adults ages 65 and over suggests that older American homeowners have substantial housing wealth but, compared with their European peers, housing represents a somewhat smaller part of their net total wealth. In this regard, American homeowners are most like older Swedish and Danish homeowners. While the prevalence of housing debt among older adults is somewhat lower in the United States than in the Netherlands, Denmark, and Sweden, among older homeowners with housing debt, Americans have the highest loan-to-value ratios and the highest proportion of homeowners whose homes may arguably be at risk of going underwater.

Whereas acquiring a home and building home equity is a precondition for using equity as a source of old-age security, the extent of the welfare-enhancing potential of a home depends on the ability to extract liquidity from it. To facilitate this process, financial institutions have developed dedicated home equity release products such as reverse/lifetime mortgages and home reversions that allow older adults to extract equity from their home while continuing to live in it, and to generally rely on selling the property to repay the loan.

The number of countries offering dedicated equity release financial products for seniors has been on the rise, but the actual market penetration of these products has been very limited across most European countries and, albeit comparatively less so, the United States. Nonetheless, our analysis of the HRS and SHARE data suggests that the potential impact of home equity release on the living standards of older Americans and Europeans could be large. If the housing equity of older Americans, for example, were completely monetized, median household income would increase by over a third – more than in countries like Sweden and Denmark but well below countries like Spain and Italy. Across all countries in our study, tapping into housing equity could substantially reduce the share of older adults with household incomes below 50 percent of the median. However, even *after* annuitizing housing wealth, the share of relatively poor older Americans would remain as high as, or higher than, the share of relatively poor older Europeans *before* accounting for annuitized housing wealth.

Despite the potentially large impact of monetizing home equity on household incomes and the economic security of older Americans and Europeans, our critical review of home equity

release and asset-based welfare policies identifies important impediments to tapping into home equity that may explain its very low use. Objective obstacles include the high cost of withdrawing the equity, uncertainty about life expectancy and the amount of financial resources required to support retirement, the adverse impact on eligibility for social benefits, and the concentration of housing wealth among (upper) middle- and higher-income individuals who are less likely to need additional resources in old age. Subjective obstacles include an aversion to assuming additional debt in old age, different (often emotional) attitudes toward housing compared with other types of wealth, bequest motives, and a lack of trust in financial institutions.

Overall, home equity has a potentially important yet limited role in supporting old-age security. Even if objective obstacles related to the design and pricing of home equity release products were fully addressed, subjective reasons for avoiding home equity withdrawal and compositional differences in the concentration of housing wealth would still limit the scope of asset-based welfare. These limitations notwithstanding, using home equity to supplement retirement incomes and improve retirement security remains a potentially attractive option for a substantial number of older adults who have built housing wealth over their lives but may either have insufficient retirement incomes or face unexpected and expensive life events (e.g. long-term care needs). What remains more uncertain and difficult to predict, though, are the long-run prospects for using home equity to support old-age security since younger generations of Americans and Europeans may find it more difficult to build home equity than their parents' generation.

Optimal Illiquidity

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We calculate the socially optimal level of illiquidity in a stylized retirement savings system. We solve the planner’s problem in an economy in which time-inconsistent households face a tradeoff between commitment and flexibility (Amador, Werning and Angeletos, 2006). We assume that the planner can set up multiple accounts for households: a perfectly liquid account and partially illiquid retirement savings accounts with early-withdrawal penalties. Revenue from the penalties is collected by the government and redistributed through the tax system. We solve for the socially optimal values of these penalties and the socially optimal allocations to these accounts. When agents have heterogeneous present-biased preferences, social optimality is achieved with three accounts: (1) a liquid account; (2) an account with an early-withdrawal penalty of ≈ 100 percent; and (3) an account with an early-withdrawal penalty of ≈ 10 percent. With heterogeneous preferences, the socially optimal retirement savings system in our stylized model looks surprisingly like the existing U.S. system: (1) a liquid account; (2) an illiquid Social Security account (and defined benefit pensions); and (3) a 401(k)/IRA account with a 10-percent penalty. The socially optimal allocations to these accounts and the predicted equilibrium flows of early withdrawals – “leakage” – also match the U.S. system.

Summary of Paper

How much liquidity should be built into a socially optimal savings system? On one hand, flexibility allows households to consume in ways that reflect their idiosyncratic preferences – i.e., households can respond to taste shocks and taste shifters. However, liquidity allows households with self-control problems (and other biases or errors) to over-consume.

If illiquidity is optimal, how should it be implemented? Possible forms of illiquidity include a perfectly illiquid retirement claim (like a typical defined benefit pension or Social Security) or a partially illiquid account (like an IRA or 401(k) plan). In theory, an optimal system might combine different types of illiquid accounts.

In the domain of practical policies, there is a partial consensus on these questions. Almost all developed countries have some form of compulsory saving that is *completely* illiquid (e.g., Social Security in the United States).

But that’s where agreement ends. For example, in most developed countries, defined contribution (DC) savings accounts are usually completely illiquid before age 55 (Beshears et al. 2015). By contrast, in the United States, certain types of withdrawals from DC accounts are

allowed without penalty, and, for IRAs, withdrawals may be made for any reason if a 10-percent penalty is paid. Liquidity allows significant pre-retirement “leakage:” for every \$1 contributed to the accounts of U.S. savers under age 55, \$0.40 simultaneously flows out of the 401(k)/IRA system, not counting loans (Argento, Bryant, and Sabelhaus, 2014). Until now, no normative model has been used to determine whether such leakage is good or bad from the perspective of overall social welfare. Nevertheless, most policy analysis bemoans leakage (e.g., Hewitt Associates, 2009).

Our paper evaluates the optimality of an N -account retirement savings system with a combination of liquid, partially illiquid, and/or fully illiquid accounts. Within this framework, we focus on two special cases: systems with two accounts and systems with three accounts. In all of our analyses, we will assume that the first account is fully liquid, so our two-account system has a fully liquid account and a partially (or fully) illiquid account. Likewise, our three-account system has a fully liquid account and two partially illiquid accounts (one of which might be fully illiquid). We show that the three-account system is a good approximation (with respect to expected welfare) for a completely general system with an arbitrary number of accounts.

We study preferences that include both normatively legitimate taste shifters and normatively undesirable self-control problems. The self-control problems are modeled as the consequence of present bias (Phelps and Pollak 1968, Laibson 1997): i.e., a discount function with weights $\{1, \beta\delta^2, \dots, \beta\delta^t\}$, where the degree of present bias is $1 - \beta$. Present bias is the propensity to overweight the present relative to the future. Our model is an aggregate version (with interpersonal transfers) of the flexibility/commitment framework of Amador, Werning, and Angeletos (2006).

We divide our analysis into the cases of homogeneous present bias and heterogeneous present bias. In the homogeneous case, we assume that all agents have the same degree of present bias – in other words, the same value of β . Under a homogeneous β , our model implies that partially illiquid accounts with early-withdrawal penalties $\pi \approx 1 - \beta$ play an economically significant role in improving social welfare.

We then relax the homogeneity assumption, and assume that agents have *heterogeneous* present-bias. In this heterogeneous-preference case, we find that fully illiquid accounts play an important role in improving welfare, whereas partially illiquid accounts matter relatively little. We show that the socially optimal degree of illiquidity mostly caters to households with the

lowest β values (i.e., the households with the largest amount of present bias, $1 - \beta$). Completely illiquid retirement savings generates large welfare gains for these low- β agents, and these welfare gains swamp the welfare losses of the high- β agents (who are made slightly worse off by shifting some of their wealth from perfectly liquid accounts to perfectly illiquid accounts).

To the extent that there is *also* a role for partially illiquid accounts in the heterogeneous- β economy, we find that they should have low early-withdrawal penalties – approximately 10 percent. This implies that the partially illiquid accounts look much like a typical 401(k) account. Moreover, these partially illiquid accounts display a high level of leakage in equilibrium. In other words, early withdrawals (i.e., pre-retirement withdrawals) are common from this partially illiquid account. This leakage is a two-edged sword: it results in part from legitimate taste shocks and in part from self-control problems (i.e., low β). The costs of the partially illiquid account to low β types (who end up paying most of the early withdrawal penalties) and benefits to high β types (who are net recipients of these penalties) are nearly off-setting, although the net effect for all of society is slightly positive. This analysis suggests that the U.S. system, which exhibits high leakage in practice, is not necessarily suboptimal (though it is “second-best” because of information asymmetries).

In summary, three findings emerge from the analysis of our stylized two-period model (which allows for mechanisms that admit interpersonal transfers and incorporates heterogeneity in present bias):

1. The constrained-efficient social optimum is well-approximated by a two-account system, with one account that is completely liquid and a second account that is completely illiquid. Little welfare gain is obtained by moving beyond this simple two-account system.
2. If a third account is added, its optimized early-withdrawal penalty is between 6 percent and 13 percent.
3. In equilibrium, the leakage rate from this (partially illiquid) third account ranges from 65 percent to 90 percent.

These properties have analogs in the U.S. retirement savings systems. The United States has fully liquid accounts (i.e., a standard checking account), fully illiquid accounts (i.e., Social Security), and a partially illiquid defined contribution system with a 10-percent penalty for early withdrawals. This partially illiquid DC system has a leakage rate of 40 percent.

Despite these similarities, it is inappropriate to conclude that our findings demonstrate the social optimality of the U.S. system. Our simulation framework is highly stylized. For example, we assume only two periods (e.g., working life and retirement). We assume a particular form of multiplicative taste shifters.¹ We assume that households are naive with respect to their present bias. We study a limited set of distributions of the present bias parameter, β .² We only study N -account retirement savings systems (instead of studying a fully general mechanism design framework).³

Much more work is needed to interrogate our three main findings. It is not yet clear whether our results – which, to our surprise, seem to rationalize the fundamental structure of the U.S. retirement savings system – will continue to hold as we enrich and expand our analysis.

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¹ We assume $\theta u(c)$, but we could have instead assumed $u(c - \theta)$. In ongoing work, we are studying this case.

² Little is known about the empirical distribution of present bias.

³ Future drafts of this paper will contain such analysis.

Can Knowledge Empower Women to Save More for Retirement?

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Even though they live longer and, therefore, face higher costs during retirement, women save less for retirement. Women start at a disadvantage for wealth accumulation because of lower salaries, more time off to care for children and elders, and spending more on health care (U.S. GAO 2007). This study focuses on a large public workforce in which women also save a lower percentage of their incomes and take on lower-return investments. A potential explanation for these gaps is that women have lower levels of financial literacy and engagement in household financial decisions (Lusardi and Mitchell 2008).

Financial literacy and engagement could be improved at relatively low cost, relative to changing lifetime earnings, labor supply, or health. Financial literacy cannot be shared among household members or passed on to survivors, making it all the more important for women who will spend long periods of retirement single. In general, financial education often has no effect on behavior, but a recent study showed that workplace financial education increased budgeting and saving, particularly for women (Collins and Urban 2016). This study examines the effects of an intervention targeted specifically to increase women's retirement saving through information and motivation.

In April 2015, several state agencies in Wisconsin implemented a multimedia education effort called Embracing and Promoting Options for Women to Enhance Retirement (EMPOWER). EMPOWER included short weekly emails with links to online testimonials and webinars, optional “lunch and learn” brownbag meetings, and posters and literature around the office. EMPOWER sought to increase the salience of planning and saving for retirement by encouraging conversations among peers. EMPOWER operated at a large scale with very low marginal costs. The choice to implement EMPOWER was made by a single agency representative, not by individual workers, and then workers received no further incentive to participate. Several large agencies did not implement EMPOWER, providing a comparison group of workers who were not exposed to financial education.

To estimate the effect of EMPOWER, we use detailed administrative data and a quasi-experimental research design. The state provided monthly longitudinal data for a workforce of 31,000 employees, for four years surrounding the program’s implementation. These workers are required to contribute 6.6 percent of earnings to a pension fund, but 47 percent of workers also participated in Wisconsin Deferred Compensation (WDC), a saving instrument similar to a 401(k). The median participant contributed 1.6 percent of earnings each month. EMPOWER

has the potential to increase both participation and contributions to WDC. To isolate the effect of EMPOWER on saving, we employ a triple-difference strategy comparing men to women before and after implementation at agencies that implemented the program versus those that did not implement the program.

We find that workplace financial education and peer-to-peer motivation increased retirement saving in this context. EMPOWER increased participation in the deferred-compensation savings plan by 2.6 percentage points, closing the gender gap in participation by more than half. We subject this result to several robustness checks, and pre-existing trends explain some of the closing of the gender gap at the EMPOWER agencies. There is not clear evidence that workers already participating saved more of their earnings.

Figure 1. Extensive Margin Effects of EMPOWER

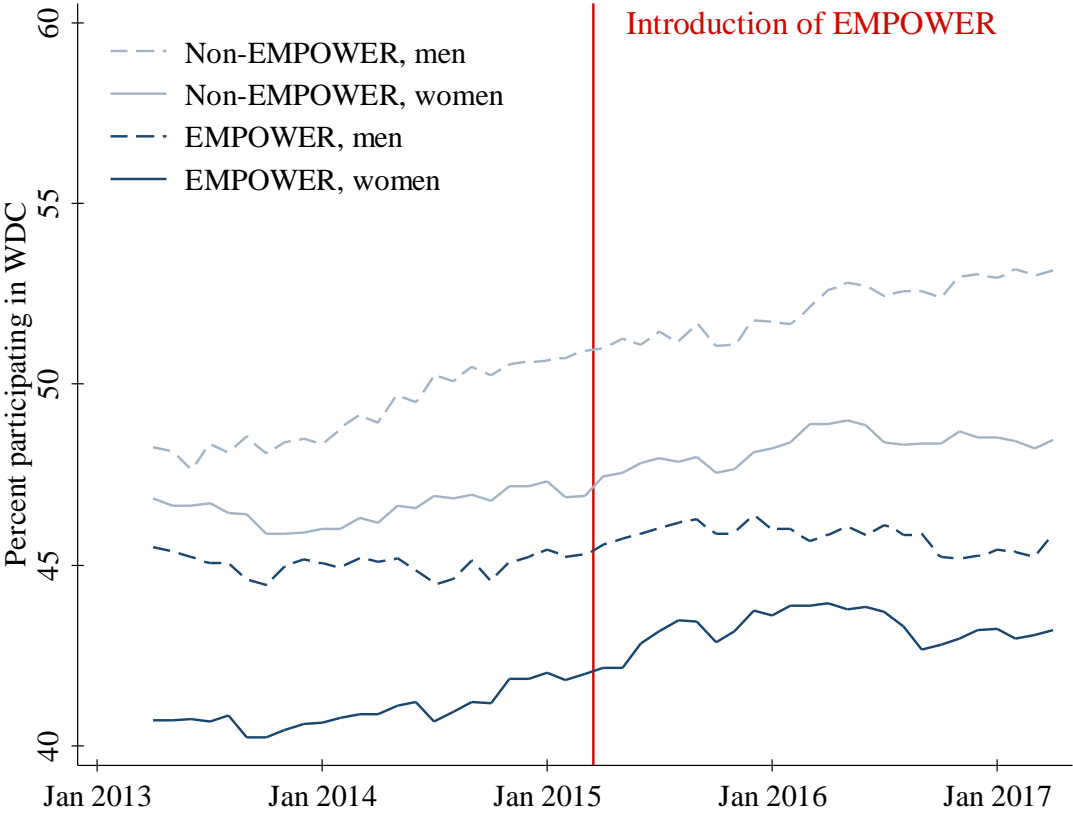


Figure 1 shows our empirical strategy graphically. The figure tracks the progression of gender gaps in retirement saving at agencies that implemented EMPOWER, versus agencies that never implemented EMPOWER. In both groups of agencies, men are more likely to participate

than women. EMPOWER agencies have a larger initial gender gap, and lower rates of participation overall. Controlling for all of these level differences, we look for a divergence in the gender gap after implementation of EMPOWER. The small rise in the “EMPOWER, women” line after implementation, relative to the other three lines, suggests a positive impact from the program.

We estimate several refinements to this graphical analysis. Controlling flexibly for month effects, employer effects, and interactions with gender, the results hold. However, controlling for employer-specific linear time trends reduces the estimated effects on participation by roughly half. Controlling for individual fixed effects further reduces the triple-difference effect, but there is still an apparent small positive effect on saving for both women and men. There is suggestive evidence the program had a greater impact for younger and married workers.

Our results provide an important contribution to research on financial education for retirement saving. The sample size, frequency, and accuracy of our data are rare in this literature, allowing us to capture with relative precision the effects of EMPOWER on WDC saving. However, we lack the ability to measure other household finances that may be affected. Researchers have come to conflicting conclusions about whether current rates of retirement saving constitute a crisis and whether information and encouragement should matter (Munnell, Rutledge, and Webb 2014). Our study, showing positive but somewhat fragile effects of financial education, is consistent with households lacking information and encouragement, but it does not settle the debate on the adequacy of saving rates.

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Panel 6: Would Social Security Changes Prompt People to Alter Their Plans?

The Behavioral and Consumption Effects of Social Security Changes

Wenliang Hou and Geoffrey T. Sanzenbacher (Boston College)

Discussant: Melissa Kahn (State Street Global Advisors)

How Do Pension Wealth Shocks Affect Working and Claiming?

Rafael Lalive (University of Lausanne), Arvind Magesan (University of Calgary), and Stefan Staubli (University of Calgary and NBER)

Discussant: Mauricio Soto (International Monetary Fund)

The Employment Effects of the Social Security Earnings Test

Alexander Gelber (University of California, Berkeley and NBER), Damon Jones (University of Chicago and NBER), Daniel Sacks (Indiana University), and Jae Song (U.S. Social Security Administration)

Discussant: Gary V. Engelhardt (Syracuse University)

The Behavioral and Consumption Effects of Social Security Changes

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Social Security's Trust Fund is projected to be exhausted in 2034. Some proposals to delay this date would cut benefits – e.g., increasing the Full Retirement Age (FRA) to 69 – while others would increase revenue – e.g., raising the payroll tax cap. While Social Security's Office of the Chief Actuary projects the financial impact on the program of a wide variety of changes, understanding the impact on recipients' behavior and well-being is also a valuable exercise. After all, any programmatic change can be calibrated to reduce Social Security's financial shortfall by a given amount, so a potentially useful tie breaker for policymakers to consider is the effect on beneficiaries. This paper uses the Gustman and Steinmeier structural model to analyze the effect of four changes to the Social Security program on recipients' retirement timing and household consumption. All four of the changes would reduce the financial shortfall by roughly 1 percent of payroll, with two of the changes being benefit reductions and the other two being increases in program revenue.¹

The Gustman and Steinmeier Model

The Gustman and Steinmeier model is described in detail in Gustman and Steinmeier (2006, 2009). The model focuses on the retirement behavior of men who begin their time in the *Health and Retirement Study* as part of a married couple. Individuals in the model are assumed to decide whether to work full-time, part-time, or completely retire and to decide on their level of consumption. The goal of individuals at each point in time in the model is to make choices that maximize their expected lifetime utility. Each individual's labor choice is affected by his age and self-reported health status, with the appeal of work decreasing with age and when the individual is in poor health. The choice of consumption is a function of any income they have from work, pensions, retirement savings, and Social Security. The forward-looking workers in the model understand that while delaying retirement may bring them disutility from the work itself, delay increases their monthly Social Security benefits and potentially their pension benefits or retirement savings and decreases the length of time their savings will need to last.

Policy simulations can be carried out in the model by altering the equations that govern how much individuals get from Social Security or by altering how much of their after-tax income can be consumed. The four changes considered in this paper are: 1) an increase in the FRA from

¹ For simplicity, the policies simulated in this paper are assumed to be implemented in one shot. In reality, the financial impact of most changes to the Social Security program assumes a more gradual phase-in.

67 to 69 with a Delayed Retirement Credit available for delaying until age 70; 2) a decrease in the Cost-of-Living Adjustment (COLA) by 0.5 percentage points, which means the real value of an individual’s benefit decreases gradually after claiming; 3) an increase in the payroll tax on employees from 6.2 percent to 7.75 percent; and 4) an increase in the taxable maximum to cover 90 percent of earnings (roughly \$270,000 in 2016 dollars).

The first two policies, which reduce benefits, would be expected to lead to delayed retirement as workers try to balance the disutility from continued work with the need to make up for a reduced Social Security benefit. The second two policies, which increase program revenues by reducing pre-retirement income, would be expected to have offsetting effects: 1) workers should retire earlier since the benefit to working is lower; but 2) they may retire later since savings during their careers were lower.

Results

Table 1 shows the share of workers who completely retire at ages 62 through 69 for each of the simulated policies (the model assumes individuals claim their benefits by age 70).

Table 1. *Share of Sample Completely Retired under Various Policies*

Age	Baseline	FRA 69	COLA	Tax increase	Raise cap
62	42.6%	40.8%	41.7%	42.6%	42.6%
63	46.8	45.0	45.9	46.9	46.8
64	49.8	49.7	48.8	49.9	49.8
65	55.0	54.5	53.8	55.1	55.0
66	59.5	56.9	58.3	59.7	59.5
67	63.0	61.5	61.4	63.2	63.0
68	66.6	65.3	65.0	66.8	66.6
69	69.2	66.5	67.5	69.3	69.2

Note: The final sample consists of 2,231 households. For a full list of sample exclusions, see Gustman and Steinmeier (2006).

Source: Authors’ calculations from *Health and Retirement Study* (HRS) and Gustman and Steinmeier (2006).

Table 1 indicates that both policies to reduce the Social Security benefit would cause people to retire later – at age 69, the reduction is 2.7 percentage points for the increase in the FRA and 1.7 percentage points for the decrease in the COLA. The behavioral effect is negligible for the revenue-based policies, with a very slight increase in the share retired under a payroll tax increase.

Because the behavioral effects are relatively small, the primary effect of the benefit reductions is to reduce the Social Security benefit and, thus, consumption in retirement. In general, the decrease in consumption is higher for individuals at the lower end of the income distribution, since they get more of their retirement income from Social Security. For example, at age 69 the average reduction in consumption under the increase in the FRA is 5.6 percent for individuals in the lowest third of the income distribution, and 2.2 percent for those in the top third. The corresponding numbers for the COLA adjustment are 2.8 and 0.8 percent. However, the effect of the COLA adjustment increases with age: for those living to age 90, the reductions are 10.5 and 4.0 percent for the lowest and highest third. Prior to retirement, the effect of benefit reductions on consumption is estimated to be relatively small, with a reduction of 0.2 percent at age 55 across income groups for an FRA increase and 0.3 percent for a reduction in the COLA, presumably because of increased saving while working.

On the other hand, an increase in the payroll tax decreases consumption primarily during the working life – by between 1.3 and 1.5 percent between ages 25 and 55 for the lowest third, and 1.2 and 1.4 percent for the highest third. The effect during retirement is smaller and operates through reduced saving prior to retirement. For example, the lowest third sees a decrease in consumption of 0.6 percent at age 69, compared to 0.5 percent for the highest third. Increasing the payroll tax cap affects only those in the top third, decreasing their consumption by about 0.5 percent during the working years and by 0.4 percent in retirement at age 69.

The results indicate that the effects of benefit reductions and revenue increases are likely to be different. Because benefit reductions result in a relatively large reduction in income concentrated over a shorter period of time, they tend to generate a larger behavioral effect with respect to retirement timing and result in larger decreases in consumption in retirement than do tax increases. But while the impact of tax increases appears smaller, it occurs over a longer period of time – consumption is reduced by a small amount over the entirety of a worker's career.

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How Do Pension Wealth Shocks Affect Working and Claiming?

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Between 1960 and 2010, the average life expectancy at age 65 in the United States increased by 4.5 years for men and 4.2 years for women. Over the same period, the average effective retirement age has declined by approximately three years. These forces have substantial fiscal ramifications for Social Security. The United States and other countries are reforming public pension programs by raising retirement ages and cutting benefits. There is little evidence on which of these two measures is more effective in delaying the labor force exit of older workers. It is possible that the statutory Full Retirement Age (FRA) acts as a social norm or as implicit advice from the government about when to claim benefits, such that raising the FRA could have an even larger effect on retirement decisions than financial incentives (e.g., by cutting retirement benefits).

This project aims to separately identify the impact of the FRA versus financial incentives on labor supply and pension claiming in Switzerland. Studying the Swiss setting is interesting. First, similar to the United States, there is no mandatory retirement in Switzerland, even though firing restrictions become less important after individuals pass the FRA. Also, there is no earnings test in Switzerland: individuals can both draw retirement benefits and continue working. Second, the effect of social norms might be especially relevant in the Swiss pension system where the FRA is the default claiming age; individuals claim automatically at the FRA, unless they announce their plan to the Social Security Administration before reaching the FRA. But FRAs as defaults could also have costs, if they induce individuals to make decisions that are not in their best personal interest. Third, we exploit exogenous variation in financial incentives and the FRA generated by a major pension reform that was implemented in two conceptually distinct steps. The first step increased the FRA for women from 62 to 63, followed by a further increase to 64, while offering early claiming at an actuarially attractive rate. The second step reverted to offering early claiming at an actuarially fair rate, notably without changing the FRA, and reinstated actuarial fairness. With this menu of implementation steps, we discuss how raising the FRA or raising the cost of claiming early affects labor supply and pension claiming.

In the empirical analysis, we estimate both a regression discontinuity design and a structural life-cycle model. The regression discontinuity design relies on the fact that the different reform steps were implemented by birth date. For example, the FRA was increased for women born in 1939 while the FRA remained at 62 for their counterparts born in 1938. We estimate the causal effects of increasing the FRA by comparing women who are born after

December 31, 1938 (treatment group) with those who are born on or before December 31, 1938 (control group). Similar discontinuities in birth date can be exploited to examine the second increase in the FRA for women from 63 to 64 and the increase in the penalty for early claiming. We estimate the causal effect of increasing the FRA in the following regression discontinuity model:

$$y_i = \alpha + \beta * D_i + \gamma_0(1 - D_i)f(Z_i - c) + \gamma_1f(Z_i - c) + X_i'\delta + \varepsilon_i$$

where i denotes the individual; D_i is a dummy that is equal to 1 if a woman is born after December 31, 1938 and 0 otherwise; Z_i denotes a woman's birth date; c is the cutoff date for the FRA increase (January 1, 1939); and f is a function of the difference between a woman's birth date and January 1, 1939. The coefficient of interest is β , which measures the impact of the increase in the FRA on the outcome variable y_i .

In a second step, we develop an estimable dynamic structural life-cycle model of retirement, pension claiming, and consumption decisions. In each period, a worker must decide whether to retire, whether to claim a pension, and how much to consume. A period in the model corresponds to an individual's age. At the start of a period, an individual knows the health status, old-age pension, wage, and value of assets. If the woman decides to continue working, she receives a wage, experiences disutility of work, and takes into account the value of retirement decisions at future ages. Our purpose is to find what kind of model (i.e., what structural parameters) can rationalize the causal estimates themselves. Motivated by the tendency of individuals to claim at the default claiming age, the FRA, despite financial incentives to do otherwise, we assume that there are two subpopulations. The first is attentive individuals who are fully rational and optimally claim based on their preferences and the constraints they face. The second population is comprised of inattentive individuals who claim at the default claiming age, regardless of the financial incentives they face. The observed claiming behavior allows us to separately identify the fraction of attentive and inattentive individuals. For example, since inattentive individuals only claim at the FRA, all individuals who claim before or after the FRA must automatically be attentive individuals.

Our empirical analysis yields the following insights. First, raising the FRA strongly affects women's labor supply. A one-year increase in the FRA increases the claiming age of

retirement benefits by about eight months and delays labor market exit by five to six months. Most of the adjustment in labor supply takes place in the year that women reach the pre-reform FRA (age 62 for the first and age 63 for the second FRA increase). Labor force participation also increases in the year before the pre-reform FRA and in the year of the new FRA, suggesting that labor market exit does not adapt immediately. Reinstating actuarial fairness does not affect labor supply exit but delays pension claiming by about four months. Second, the large response to the FRA increases and the modest response of reinstating actuarial fairness suggest that many individuals are inattentive vis-a-vis their pension claiming decision and simply follow the default option. Third, we find evidence that some women respond to the FRA increase by seeking benefits from other social insurance programs, in particular the unemployment and disability insurance programs, but the amount of benefit substitution is relatively modest.

In conclusion, our work suggests that increasing the FRA is an effective policy, delaying both labor market exit and the claiming of retirement benefits. For each year of increasing the FRA, the exit and claiming ages increase by around 0.5 years. On the other hand, pure financial incentives have only a modest impact on pension claiming and labor supply. The reason for these divergent responses can be attributed to the fact that, in the Swiss setting, the FRA is the default claiming age. Unlike in Switzerland, U.S. retirees need to make an active decision to start claiming Social Security benefits. However, Behaghel and Blau (2012) show that many individuals in the United States also perceive the FRA as a social norm or as implicit advice from the government. Our findings will have implications for the U.S. context, if only in identifying an upper bound of the effect of the FRA.

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The Employment Effects of the Social Security Earnings Test

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The Social Security Annual Earnings Test (AET) can have a large effect on Social Security Old Age and Survivor Insurance (OASI) benefits, and therefore could have an important effect on the employment rate of older workers. The AET reduces claimants' current OASI benefits as a proportion of earnings, once a claimant earns in excess of an exempt amount.¹ For example, for OASI claimants before the year of their Full Retirement Age (FRA), current OASI benefits in 2017 are reduced by 50 cents for every extra dollar earned above \$16,920. Over the past several decades, policymakers have made the AET progressively less stringent. Most recently, the Senior Citizens Freedom to Work Act of 2000 eliminated the AET for those above the FRA. A key motivation for reducing the stringency of the AET is the possibility that it may induce OASI claimants not to work.

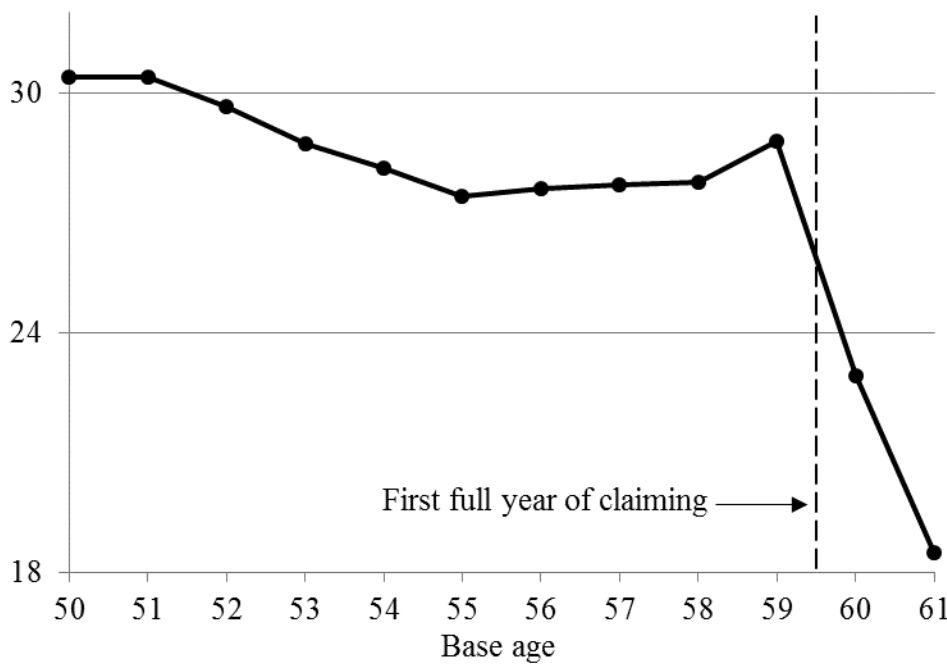
In this paper, we examine the AET's effect on decisions to remain or stop working. Past literature has mostly focused on its effect on decisions about *how much to work*, given that the individual chooses to work at all (e.g. Burtless and Moffitt 1985; Friedberg 1998, 2000; Song and Manchester 2007; Gelber, Jones, and Sacks 2013; Engelhardt and Kumar 2014). A smaller literature has examined the AET's effect on *whether* to work (Gruber and Orszag 2003; Song and Manchester 2007; Haider and Loughran 2008; Friedberg and Webb 2009), by comparing groups over time affected by changes in AET rules to groups unaffected by these changes.

We use a novel methodological approach to study this question. In particular, we focus on employment patterns among those with earnings above and below the AET exempt amount. Using a differences-in-differences design, we compare employment rates after reaching the Social Security retirement age among those previously earning above and below the AET exempt amount, who form the treatment and control groups, respectively. We use earnings three years prior as a proxy for the earnings an individual would desire in the absence of the AET. Figure 1 below shows that among those earning above the exempt amount in year t relative to those earning below it, the probability of working in year $t+3$ jumps down sharply when $t=60$ and $t+3=63$. Age 60 is exactly when individuals will first be able to show an employment

¹ Reductions in current benefits due to the RET sometimes lead to increases in later benefits through so-called "benefit enhancement." Prior to 2000, both the actuarial adjustment and the Delayed Retirement Credit sometimes enhanced subsequent benefits when current benefits were reduced by the RET. Nonetheless, several factors may explain why individuals' earnings still respond to the RET: individuals with short expected lifespan, who face borrowing constraints or who prioritize current income over future income, would be expected to respond to the RET. In addition, the RET was, on average, roughly actuarially fair for those above the FRA only beginning in the late 1990s. Finally, many individuals may not understand the RET or other aspects of OASI rules (Liebman and Luttmer 2015; Brown et al. 2013).

reaction to the AET three years later, when they are age 63.² This is followed by another sharp decrease, from 63 to 64, consistent with a lagged adjustment to the AET (Gelber, Jones, and Sacks 2013). In other words, those who tend to be subject to the AET show a large decrease in the probability of employment once they are subject to the AET, relative to a control group less likely to be subject to the AET.

Figure 1. *Employment Rates in Year $t+3$, Among Those Earning Above and Below the Exempt Amount, by Year- t Age*



Our results show larger effects on employment than most previous literature had indicated: our point estimates suggest that the AET reduces the employment rate of older Americans ages 63-64 by several percentage points. This finding reinforces and extends the conclusions of Gelber, Jones, Sacks, and Song (2017) – who found strong employment responses to the AET in a more limited region closer to the exempt amount – with a new and complementary method. These results suggest that the AET is currently an important factor that

² The AET first applies to claimants when they reach OASI eligibility at age 62, but it does not make sense to examine the effect of the AET on whether an individual has positive earnings in the calendar year that s/he turns 62. The reason is that we observe calendar year earnings. If an individual claims OASI at 62, the AET applies only to earnings in the months after the individual claims. If the claimant earns at all during this calendar year – even during months prior to claiming OASI – then s/he will have positive earnings in this calendar year.

is causing retirement under the FRA. However, we also emphasize that in evaluating the desirability of the AET, some observers laud the AET's enhancement of benefits for older OASI recipients. Research will continue to illuminate the magnitude of the AET's costs and benefits.

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Panel 7: How Do Labor Policies and Job Characteristics Influence Retirement?

Understanding Earnings, Labor Supply, and Retirement Decisions

Xiaodong Fan (Monash University) and Ananth Seshadri and Christopher Taber (University of Wisconsin-Madison)

Discussant: Anthony Webb (The New School's Schwartz Center for Economic Policy Analysis)

The Value of Working Conditions in the United States

Nicole Maestas (Harvard University), Kathleen J. Mullen and David Powell (RAND Corporation), Till von Wachter (University of California, Los Angeles), and Jeffrey B. Wenger (RAND Corporation)

Discussant: Sita Nataraj Slavov (George Mason University)

Work-Life Balance and Labor Force Attachment at Older Ages

Marco Angrisani (University of Southern California), Maria Casanova (California State University, Fullerton), and Erik Meijer (University of Southern California)

Discussant: Matthew S. Rutledge (Boston College)

Understanding Earnings, Labor Supply, and Retirement Decisions

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Understanding retirement behavior is fundamental to analyzing the impact that policy changes will have on the well-being of older Americans. How important are health shocks in triggering retirement? What are the effects of extending Social Security's Full Retirement Age (FRA) on the labor force participation rate of older workers? To what extent would the elimination of the payroll tax above the FRA induce people to stay in the workforce longer? These are important questions, and we seek to answer them in a framework in which retirement and earnings profiles are endogenous.

The retirement literature typically takes the wage process as given and estimates the date of retirement. One typically sees wages fall substantially before retirement. Raw wages for individuals who work fall over 25 percent between ages 55 and 65. In the retirement literature, this trend is extremely important for explaining retirement behavior. If workers do not earn much, it is privately optimal for them to retire. A policy such as extending the FRA to 70 could have negative consequences for workers who have low wages at this point in their lives. Life-cycle human capital models provide a different perspective. They take the retirement date as given, but model the formation of wages. Young workers optimally choose to invest in their human capital, which results in wage growth. Wages then level off in mid-career. As workers approach retirement, they optimally stop investing and allow their skills to depreciate. This behavior leads to a fall in wages right before retirement. These models have very different predictions about changes in the retirement age. In the first type of model, workers will see substantial declines in their wages, and we may be forcing workers to work at very low wages. By contrast, in the human capital model, investment will adjust. If the retirement age is extended to 70, workers will invest in human capital until a later age. Thus, rather than see wages start to fall at age 55, this decline would likely be delayed until the early 60s. Endogenizing the wage process could lead to very different welfare effects when extending the retirement age.

Quite surprisingly, aside from the seminal work in Heckman (1976), there has been little effort integrating these two important paradigms. This paper attempts to fill this void by estimating a life-cycle model wherein the wage, labor supply, and retirement choices are rationalized in one unified setting. After endogenizing both labor supply and human capital, this model is rich enough to explain the life-cycle patterns of both wages and labor supply, with a focus on wage patterns and retirement at the end of working life.

Specifically, we develop and estimate a human capital model in which workers undertake consumption, human capital investment, and labor supply decisions. We estimate the model using indirect inference, matching the wage and hours profiles of male high school graduates from the *Survey of Income and Program Participation* (SIPP). With a parsimonious life-cycle model in which none of the parameters explicitly depend upon age or experience, we are able to replicate the main features of the data. In particular, we match the large increase in wages and very small increase in labor supply at the beginning of the life-cycle, as well as the small decrease in wages but very large decrease in labor supply at the end of the life-cycle.

While our baseline model does not incorporate health, we estimate a specification that allows the taste for leisure to depend on health and for this effect to increase with age. Surprisingly, such an “enhanced” model does not significantly improve the fit of the life-cycle patterns of wage and labor supply of the SIPP data. We also show that even within this model that allows a direct and flexible effect of health on labor supply, health plays a relatively minor role in the decline in labor supply late in life.

We use the estimated model to simulate the impacts of various Social Security policy changes. Much serious work has been developed to quantitatively estimate the economic consequences of an aging population and evaluate the remedy policies. This previous research models retirement as a result of combinations of declining wages, increasing actuarial unfairness of the Social Security and pension systems, and increasing tastes for leisure. However, there is a notable difference between our model and the several papers in the literature. Prior work typically takes the wage process as given and focuses on the retirement decision itself. For example, when conducting the counterfactual experiment of reducing the Social Security benefit by 20 percent, the previous literature takes the same age-wage profile as in the baseline model and re-estimates the retirement behavior under the new environment. Since the wage had already been declining significantly and exogenously approaching the retirement age, working is, under the new policy, still less likely to be attractive for many workers.

However, as we show in our model, less generous Social Security benefits result in higher labor supply later in the life-cycle, so workers adjust their investment over the life-cycle, which results in a higher human capital level, as well as higher labor supply earlier. On average, the observed wage levels are 5 percent higher between 65 and 80. Over the whole life-cycle, observed average yearly wages, total labor income, and total labor force participation rates

increase by 1.5 percent, 2.17 percent, and 1.57 percent, respectively. By contrast, in the model with exogenous human capital, the percentage increases in yearly wages, total labor income, and total labor supply are less significant: 0.2 percent, 1.26 percent, and 1.31 percent, respectively. The differences are more dramatic in the experiments in which we remove the Social Security system, with the exogenous model underestimating most effects.

First, we remove the Social Security earnings test, which is effective between ages 62 and 70 in the baseline model. In the second, we delay the FRA by two years: the new FRA is 67 in this counterfactual experiment, while it is age 65 in the baseline model. In the third, we reduce the Social Security benefit proportionally by 20 percent. Removing the Social Security earnings test between ages 62 and 70 has a smaller effect on all variables; delaying the FRA by two years has a slightly larger impact; reducing the generosity of the Social Security benefit has the largest effect among these three. These policies increase labor force participation by 4.5, 5, and 7.5 months, respectively. In almost every policy counterfactual, the increase in the endogenously determined wage levels is substantial. This is especially true at old ages: 6 percent when removing the earnings test or reducing the Social Security benefit, 3 percent when delaying the FRA by two years, and over 10 percent when removing the Social Security benefit or the entire system. These are caused by increases in the human capital levels as a result of higher investment. For this reason, it is likely that ignoring the human capital investment channel would generate bias in terms of predicting the labor force participation rate at old ages in similar experiments.

The Value of Working Conditions in the United States

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Labor supply decisions are often modeled as a function of wages, and there is widespread interest in understanding wage differentials across different demographics as well as wage inequality more generally. It is also recognized, however, that wages do not reflect the full compensation that individuals receive from working, since jobs vary based on attributes such as schedule flexibility and physical demands. Individuals may “purchase” better job amenities by accepting jobs with lower wages that have their desired characteristics. These tradeoffs between wages and amenities may be systematic and distort the metrics of wage inequality or wage differentials.

It is difficult to isolate the wage-amenity tradeoffs that individuals are willing to make. Equilibrium wages are functions of both individual preferences and firm-level decisions, obscuring individual valuations of their on-the-job amenities. Labor market frictions may also deter individuals from transitioning to their preferred jobs. Moreover, job amenities are not randomly assigned and are potentially correlated with unobserved determinants of wages, suggesting non-causal correlations between wages and job amenities that do not reflect the tradeoffs that individuals actually face. Researchers observe equilibrium outcomes of complicated worker- and firm-level interactions, with little information about the alternative jobs that each worker would reasonably consider.

Despite these difficulties, estimating the valuations on job characteristics is critical for understanding labor supply decisions and cross-sectional and temporal wage variations. Wage differentials across groups are potentially a function of the types of jobs that individuals have selected. In this paper, we study the importance of non-wage attributes in job choice decisions and explore the role of job amenities in explaining the wage structure.

Data and Methods

Using a nationally representative (when weighted) Internet panel known as the *RAND American Life Panel*, we survey 1,818 individuals on their preferences for jobs, which vary based on wages and job amenities. We then present each respondent with a set of job choices and ask them to select their preferred job. We categorize jobs based on 10 attributes: full-time status, schedule flexibility, telecommuting opportunities, physical demands, pace of work, independence, paid time off, working with others, job training opportunities, and impact on society. We also specify weekly hours and monetary compensation.

Given these data, we are able to quantify the wage-amenity tradeoffs that individuals are making and estimate valuations for each job characteristic. The advantage of this approach is the ability to fully control the choice set while permitting the randomization of alternatives. By determining and observing the full choice set, we eliminate concerns that the choice set is endogenous to individual- or market-level factors. We also collect data on the respondents' current job characteristics. This information, along with the estimated valuations, permit us to analyze how wage differentials across gender, race, and age change when differences in job characteristics are also accounted for.

Specifically, we assume that the indirect utility function is linear:

$$V_{ijt} = \alpha + \mathbf{x}'_{ijt}\beta + \delta \ln w_{ijt} + \varepsilon_{ijt},$$

where V_{ijt} represents indirect utility for individual i , alternative j , for choice t ; \mathbf{x} is the set of non-wage characteristics; and w is the wage. We use the log of the wage, because we anchor each person's wage offer to their most recent wage, and there are large cross-sectional wage differences in our data. Assuming that ε_{ijt} is an Extreme Value Type I random variable, we estimate the probability that an individual selects a job with characteristics \mathbf{x}_{ijt} over a job with characteristics \mathbf{x}_{ikt} using

$$P(V_{ijt} > V_{ikt}) = \frac{\exp[\alpha + \mathbf{x}'_{ijt}\beta + \delta \ln w_{ijt}]}{\exp[\alpha + \mathbf{x}'_{ijt}\beta + \delta \ln w_{ijt}] + \exp[\alpha + \mathbf{x}'_{ikt}\beta + \delta \ln w_{ikt}]}$$

We define our willingness-to-pay measure for amenity r by the equation:

$$\delta \ln w = \beta^r + \delta \ln[w - WTP^r].$$

The individual is indifferent between not having the amenity and having the amenity with a corresponding wage decrease equal to WTP^r . Solving for the willingness-to-pay measure:

$$WTP^r = w \left[1 - e^{\left(\frac{-\beta^r}{\delta}\right)} \right].$$

This is the measure we report when discussing our results below. For interpretation, gaining amenity r is equivalent to a $100 \left(1 - e^{\left(-\frac{\beta r}{\delta} \right)} \right) \%$ wage increase.

Findings and Discussion

We find systematic differences in job characteristics across groups. For example, 18.8 percent of men report working in a job that requires intense physical activity, compared to 11.6 percent of women. On the other hand, 63.2 percent of men report that they have some control over their work schedule, while only 57.8 percent of women do. We study both the importance of these types of differences in current job characteristics as well as differences in valuations across groups.

We find that these characteristics have substantial explanatory power in explaining job choices. We estimate that a switch from a physically demanding job to a job requiring only moderate physical activity is equivalent to a 20-percent wage increase, while schedule flexibility is similar to a 9-percent wage increase. Paid time off is also highly valued. We estimate statistically significant effects on all dimensions, ranging between 4 percent and 24 percent of the wage. In total, we find that a switch from the worst job, in terms of on-the-job amenities, to the best job is equivalent to a 64-percent wage increase. This metric is robust to functional form assumptions.

Using our estimates, we study whether amenities reduce or exacerbate existing wage differentials. When focusing only on the different incidences of amenities across groups, we find that variation in amenities does not alter differentials based on gender, race, or age. However, the differential between those with a college degree and those without increases when amenity variation is taken into account. When we permit valuations to also vary across groups, we find that amenities play an important role in compensation differences. Our valuations vary substantially by group. For example, we estimate that a job requiring “heavy physical activity” is equivalent to a 17.7-percent wage decrease when compared to a job that involves mostly sitting. However, there is substantial variation across age groups. For ages 25-49, this characteristic is equivalent to a 12.1-percent wage decrease, while respondents ages 62 and older value it as corresponding to a 24.1-percent wage decrease.

When accounting for these differences in valuations, we find that the differentials across groups are meaningfully affected. The gender gap actually decreases when permitting valuations to vary by gender. In our data, we observe a 20-percent wage gap between men and women. When amenities are factored in, this gap shrinks to 9 percent. However, the wage differentials increase when defined by race, education, and age. For example, whites earn 9 percent higher wages than non-whites. When amenities are included, this differential increases to 22 percent. College-educated individuals earn 49 percent higher wages, but this differential increases to 70 percent when amenities are accounted for. Finally, individuals ages 50 and over earn (a statistically insignificant) 5 percent more than their prime-age counterparts (ages 35-49). When amenities are included, the differential increases to (a statistically significant) 12 percent.

Work-Life Balance and Labor Force Attachment at Older Ages

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Demographic trends over the past five decades have led to longer life expectancies and declining birth rates. The resulting concerns about the long-term sustainability of Social Security programs have focused attention on understanding what drives individual retirement decisions and on how to increase older workers' attachment to the labor force. A growing literature has identified work-life balance (WLB), defined as the absence of conflict between work and non-work activities, as a key determinant of workers' evaluations of the relative attractiveness of work versus leisure, particularly at older ages. Workers whose jobs allow them to more easily manage their private lives (doctor visits, caring for an elderly parent or sick spouse, etc.) may be more likely to remain employed than those who perceive that their jobs interfere with their personal activities and responsibilities.

A better understanding of the effect of WLB on retirement behavior, and of the specific life circumstances during which WLB becomes valuable to employees, provides a policy handle to affect workplace arrangements so as to facilitate longer labor force attachment. This line of research is particularly timely in view of the increase in women's labor force participation in the past decades, which has led to a growing number of female workers on the verge of retirement. Because of existing social norms related to gender roles, women are typically more sensitive to the trade-off between career and family life. At the same time, late fertility and longer life expectancy have placed more responsibility on middle-age/older workers for supporting their own children and caring for their aging parents, thus increasing the strain on WLB.

In this paper, we use data from the *Health and Retirement Study* (HRS) to investigate the relationship between WLB and retirement transitions. We use a sample of workers ages 51 to 79 to assess the extent to which WLB is associated with subsequent employment choices. We perform our analysis separately for men and women to explore the possibility of differential labor supply responses by gender. Because of the prevalence of partial retirement, and given that part-time work may be an important alternative to retirement in the face of WLB restrictions, we distinguish between full-time and part-time workers. Moreover, our analysis jointly accounts for work strains that affect one's private life negatively (work-to-life interference, or WLI) and aspects of one's private life that may negatively impact one's productivity or work (dis)utility (life-to-work interference, or LWI).

Additionally, we explore the extent to which WLB interacts with life circumstances in determining retirement decisions. A prime example of a situation in which WLB may tip the scales in favor of continued employment or retirement is when an individual's spouse experiences a health shock. This situation may require new caregiving responsibilities and may also affect expectations about mortality, which in itself may alter the relative utility of work versus leisure. We investigate this possibility by studying how responses to a spouse's health shock differ by WLB levels before the onset of the shock. In view of previous research documenting gender differences in the responses to family members' health shocks, we again perform the analysis separately for men and women.

We find that WLB is significantly associated with employment transitions and document interesting heterogeneity by gender and employment status. Our results are mainly driven by perceived interference from work into private life. A one-standard-deviation increase in WLI increases the retirement probability of males in part-time work by 5.9 percentage points, that of females in full-time work by 2.2 percentage points, and that of females in part-time work by 4.6 percentage points. These effects are sizeable, representing a 27 percent, 16 percent, and 23 percent increase relative to the sample average, respectively. WLI does not significantly correlate with employment transitions of men in full-time work.

After controlling for WLI, there is no association between perceived interference from life to work for either men or women in full-time employment. For part-timers, a one-standard-deviation increase in LWI is associated with marginally significant 4.6-percentage-point and 3.0-percentage-point increases in the probability of remaining in part-time employment for men and women, respectively. Although the estimates are not significant, an increase in LWI is also associated with lower probabilities of transitioning into both full-time work and retirement. These findings may indicate a combination of a negative effect of LWI on labor supply, preventing some part-timers from transitioning into full-time work, and a positive effect, inducing some others to delay retirement, perhaps because they find respite on the job from their family conflicts. On the whole, we refrain from attaching too much weight to these findings, because the relevant parameters are imprecisely estimated.

Our next set of results shows that WLB moderates labor supply responses to a spouse's health shock. Once more, there exist interesting differences between men and women. For men, the probability of remaining in full-time employment following a spouse's health shock

decreases by 4.2 percentage points for each one-standard-deviation increase in the level of WLI. This gradient, however, is only significant at 10 percent. Moreover, there is no moderating effect of WLI for part-timers. In line with previous studies, women's labor supply is more responsive to changes in a spouse's health, and these responses are moderated by the perceived degree of WLB. For women in full-time employment, the probability of switching to a part-time job following a spouse's health shock increases by 4 percentage points with each one-standard-deviation increase in WLI. For those employed part-time, the probability of retirement is 8 percentage points higher for each one-standard-deviation increase in the WLI index.

Our study is the first to address and quantify the association between WLB and actual employment transitions of middle-age and older workers. Previous research has suggested a potential link between WLB and retirement behavior by showing that full-time workers in their early 50s who experience low levels of WLB are more likely to report a preference for retiring within the next 10 years. Interestingly, these studies find no gender differences in the association between WLB and self-reported retirement intentions. In contrast, our paper shows that a lack of WLB is more likely to induce females than males to actually retire. A further contribution of our research is to establish that life circumstances affect an individual's willingness to tolerate the absence of WLB. Specifically, WLB moderates labor supply responses to spousal health shocks.

A limitation of our study is that, while controlling for a wide array of variables that may affect both WLB and employment transitions, we cannot completely rule out that other, unobservable factors may drive the estimated relationship between WLB and labor supply decisions. Because of that, we refrain from making causal claims throughout the text. Such factors plausibly comprise individual aptitudes and preferences underlying selection into jobs with certain characteristics, including the level of WLB, as well as tastes for the mode and timing of retirement. It should be noted, however, that these individual traits would likely bias our parameters of interest downward, hence toward the null hypothesis of no relationship between WLB and employment transitions. We would expect individuals who have a stronger preference for leisure over work to have a higher likelihood of selecting into jobs with better WLB and to retire earlier, other things equal. This selection mechanism would imply that individuals with better WLB may be more prone to reduce their labor supply. Our findings that worse WLB is associated with a higher likelihood of transitioning into partial and full retirement contradict this

argument and are suggestive of a causal, positive link between WLB and prolonged attachment to the labor force.

The institutional framework in which individuals work is bound to affect work-life balance. Laws that make it mandatory for employers to offer part-time arrangements to their employees and programs introducing or extending paid leave opportunities for family reasons are examples of policies that may improve WLB and, in turn, facilitate longer labor force attachment among older workers. Policy changes affecting the work flexibility of some workers and not others (e.g., paid family leave insurance laws becoming effective in California, New Jersey, Rhode Island, and Washington between 2004 and 2019) may also be exploited to infer stronger and more robust causal relationships between WLB and employment transitions. We leave this for future research.

Bios

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Arvind Magesan is an associate professor in the department of economics at the University of Calgary. His primary area of research is methods and applications in structural econometrics. On the methodological side, his interests lie in the identification, estimation, and solution of dynamic models, including models with strategic interaction (games). He applies these methods to research questions in the fields of political economy, industrial organization, and public finance. Dr. Magesan holds a Ph.D. in economics from the University of Toronto.

Melissa McInerney is an associate professor of economics at Tufts University. Before joining Tufts, she was on the faculty at the College of William and Mary. She has published widely, examining questions relevant to social policy. In her work, she has examined the Medicare program, workplace injuries and compensation for injured workers, and wage gaps by race and ethnicity. She is a recipient of research grants from the Russell Sage Foundation, the U.S. Department of Labor, the W.E. Upjohn Institute for Labor Research, and the Center for Retirement Research at Boston College. Professor McInerney's research has been published in leading economics journals such as the *Journal of Labor Economics*, the *Journal of Health Economics*, the *Journal of Human Resources*, and the *Journal of Public Economics*. Her work has also been published in the leading health policy journal *Health Affairs*. Professor McInerney holds a B.A. from Carleton College, an M.P.P. from Georgetown University, and a Ph.D. in economics from the University of Maryland, College Park.

Erik Meijer is a senior economist at the Center for Economic and Social Research at the University of Southern California. Previously, Erik was an economist at the RAND Corporation, an assistant professor at the University of Groningen, and a researcher at MuConsult transportation consultants. Much of his current research is in the economics of aging. Recent and ongoing work includes studying the effects of individual beliefs about stock market returns on retirement wealth, modeling the relationship between non-monetary job characteristics and retirement, and investigating the relation between retirement and cognitive decline. He received his Ph.D. in social sciences from Leiden University.

Emmanuel Garcia Morales is a Ph.D. candidate in economics at Johns Hopkins University. His dissertation studies the unintended consequences of SSI participation on the health, education, and work experience of youths with disabilities, which he will defend in October. Emmanuel's main area of research is health and labor economics. He will begin working as a researcher at the Johns Hopkins Bloomberg School of Public Health this fall.

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Alicia H. Munnell is the Peter F. Drucker Professor of Management Sciences at Boston College's Carroll School of Management. She also serves as the director of the Center for Retirement Research at Boston College. Before joining Boston College, Munnell was a member of the President's Council of Economic Advisers and assistant secretary of the U.S. Treasury for economic policy. Previously, she was senior vice president and director of research at the Federal Reserve Bank of Boston. She has published articles, authored books, and edited volumes on tax policy, Social Security, public and private pensions, and productivity. Munnell was co-founder and first president of the National Academy of Social Insurance (NASI) and is currently a member of the American Academy of Arts and Sciences, Institute of Medicine, and the Pension Research Council at the University of Pennsylvania's Wharton School. She is a member of the board of The Century Foundation, the National Bureau of Economic Research, and the Pension Rights Center. In 2007, she was awarded the International INA Prize for Insurance Sciences by the Accademia Nazionale dei Lincei in Rome. In 2009, she received the Robert M. Ball Award for Outstanding Achievements in Social Insurance from NASI. In 2015, she chaired the U.S. Social Security Advisory Board's Technical Panel on Assumptions and

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Claire Xiaozhi Wang is a research assistant in the Income and Benefits Policy Center at the Urban Institute and a member of the program on retirement policy. She is an experienced data analyst, with expertise with the *Health and Retirement Study*, *Survey of Income and Program Participation*, *Current Population Survey*, and *American Community Survey*. Wang has contributed to research projects on older Americans' retirement security and retirement decisions, long-term services and supports for older adults, and reform proposals for state and local pensions and Social Security. She graduated with a dual B.A. in economics and political and social thought from the University of Virginia.

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Jeffrey B. Wenger is a senior policy researcher at the RAND Corporation. Wenger was formerly an assistant and associate professor at the University of Georgia, where he taught econometrics, statistics, economics, and policy evaluation. He was also a National Institutes of Health/National Institute on Aging research fellow in the study of aging at RAND in Santa Monica. His current research examines the effects of working conditions on remaining in the labor force, and the transitions of military personnel into the civilian labor force. He is also leading a project on long-term unemployment among late-career workers. Wenger's primary expertise is in unemployment insurance (UI); he has published studies in the areas of UI financing, automatic triggers for extending UI benefits, and the role of information on UI application rates. Wenger is also interested in issues of retirement and the role of business cycles on retirement savings. He has published research on the asynchronicity of stock and labor markets and its effects on retirement savings, and research on preference heterogeneity and its role on savings rates and borrowing options in defined contribution plans. He received his Ph.D. in policy analysis from the University of North Carolina, Chapel Hill.

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April Yanyuan Wu is a researcher at Mathematica Policy Research. She is the principal investigator on several research projects funded by the U.S. Social Security Administration's Disability Research Consortium. Prior to Mathematica, Dr. Wu was a research economist at the Center for Retirement Research at Boston College. Dr. Wu's research interests cover a broad area of topics in public finance and labor economics, with emphasis on the economics of aging. Specifically, her research has considered older workers' employment behaviors and disability insurance claiming patterns, the safety net for and well-being of the older population, and issues related to poverty and inequality. She holds a Ph.D. in public policy from the University of Chicago.

Han Ye is a Ph.D. candidate in economics at Boston University. Her fields of concentration are labor economics, public policy, and applied microeconomics. Currently, she focuses on researching labor market behaviors of older workers in response to retirement policy reforms, in the context of Germany. Her research covers topics such as the effects of pension subsidies on retirement timing, older workers' labor supply responses to unemployment insurance extensions, and employment beyond retirement. She has also worked on a project on incentive-based adaptive regulation in health care financing in developing countries, commissioned by the Center for Global Development, funded by the Gates Foundation. She is also interested in research related to displaced workers' labor outcomes, the gender pension gap, and other social programs. She holds a B.A. from the University of International Business and Economics in Beijing and an M.A. in economics from Boston University.

Registrants

MEETING REGISTRANTS
as of July 27, 2017

LUÍS AFONSO, *University of Sao Paulo*
SHAI AKABAS, *Bipartisan Policy Center*
BRIAN ALLEVA, *ORDP/ORP*
RAMSEY ALWIN, *AARP*
VINEETA ANAND, *Cheiron*
DREW ANDERSON, *University of Wisconsin-Madison*
MARCO ANGRISANI, *University of Southern California*
PHILIP ARMOUR, *RAND Corporation*
WILLIAM ARNONE, *National Academy of Social Insurance*
ELIZABETH A. ASHACK, *Dept of Labor, Bureau of Labor Statistics*
PADMAJA AYYAGARI, *University of Iowa*
STEPHANIE BARELLO, *Congressional Budget Office*
SUSAN BARNES, *Michigan Retirement Research Center*
STEVEN BASS, *Investment Company Institute*
FRANCOISE BECKER, *ORDP/ORES*
ANEK BELBASE, *Center for Retirement Research at Boston College*
GERARD BERGSMA, *People's Pension Holding*
DIDEM BERNARD, *AHRQ*
DEBORAH BISCO, *Pension Benefit Guaranty Corp.*
TROY BLOCK, *The Capital Group*
JIM BORLAND, *OCOMM*
G. B. BOSE, *Washington Retirement Planning Specilists*
BARBARA BOVBJERG, *U.S. Government Accountability Office*
PETER BRADY, *Investment Company Institute*
CHERI BROOKS, *Michigan Retirement Research Center*
JEFFREY R. BROWN, *University of Illinois and NBER*
JENNIFER BROWN, *National Institute on Retirement Security*
ROBERT BURNS, *Merrill Lynch*
WENQIANG CAI, *University of Virginia*

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